

ANNEX 5.4
OPERATIONS

<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARDS</u>
	<p>Technician for support of Programmatic or Scheduled Operations during normal working hours.</p> <p>(e.g., Test Complex) beginning 30 minutes prior to the scheduled test firing (or other scheduled activity). The Government will provide approximately 2 hr notification prior to start of test, but no less than 1 hr notification.</p> <p>Technicians shall check in with Program Operators (e.g. Test Area Operators), upon arrival at the site, for briefing and specific instruction. Minimum requirements include logging of chiller and boiler parameters prior to tests (See 5.4.2.2.1 and 5.4.4.2.2.3), check-in with EMCS for alarming or equipment problems, investigate areas of concern as instructed by Program Operators, and report potential problems/concerns to the EMCs and to Program Operators, mitigate and repair (as approved by Program Operator) to prevent interruption of programmatic activities.</p> <p>Technician shall be equipped with transportation, tools and supplies which shall include a vehicle, ladders, hand tools, multimeter, temperature and humidity measuring devices, refrigerant gauges, air flow and differential pressure measuring devices and other tools as necessary to troubleshoot HVAC and Refrigeration systems.</p>	<p>Historically, duration for each support activity is approximately 3 hrs.</p> <p>Technician shall be located within the area of assignment (e.g., Test Complex) beginning 30 minutes prior to the scheduled test firing (or other scheduled activity). The Government will provide approximately 3 hr notification prior to start of test, but no less than 2 hr notification.</p> <p>Technicians shall check in with Program Operators (e.g. Test Area Operators), upon arrival at the site, for briefing and specific instruction. Minimum requirements include logging of chiller and boiler parameters prior to tests (See</p>	<p>(e.g., Test Complex) beginning 30 minutes prior to the scheduled test firing (or other scheduled activity). The Government will provide approximately 2 hr notification prior to start of test, but no less than 1 hr notification.</p> <p>Technicians shall check in with Program Operators (e.g. Test Area Operators), upon arrival at the site, for briefing and specific instruction. Minimum requirements include logging of chiller and boiler parameters prior to tests (See</p>	<p>respond.</p>
5.4.4.2.1.10	<p>Provide HVAC/Refrigeration Technician for support of Programmatic or Scheduled Operations during non-working hours.</p>	<p>30 hours of support annually.</p>	<p>No instances of failure to respond.</p>	

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5.4.4.2.2.1	Maintain a Log of Centrifugal/Screw Compressor Chiller parameters, during operating periods	The Contractor shall log operating parameters for Centrifugal/Screw Compressor Chillers. Logged data shall include entering/exiting water temperatures, amp readings, loading, oil pressures, oil level, refrigerant pressures, purge unit run time (where applicable), general conditions and observations, date and time, logging technician, and any other pertinent data. Logged data shall be reviewed for evidence of equipment deterioration. Conditions threatening the reliability and safety of the equipment shall be reported for corrective action. Equipment shall have data logged within 8 hours of being returned to service after service/repair, change of season start-up, etc. Equipment log shall record date (within 5 work days)	21 Units	Log Chillers Weekly. Log shall be accurate and current, and shall be available for Government review upon request. Log shall be maintained on record for 24 months.
5.4.4.2.2.2	Standing Work	Historically, duration for each support activity is approximately 3 hrs.		

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5.4.4.2.2.2	Maintain a Log on Chiller parameters at buildings 1110, 1200 and 1201, during operating periods.	<p>The Contractor shall log operating parameters for Chillers. Logged data shall include entering/exiting water temperatures, amp readings, loading, oil pressures, oil level, refrigerant pressures, general conditions and observations, date and time, logging technician, and any other pertinent data.</p> <p>Logged data shall be reviewed for evidence of equipment deterioration. Conditions threatening the reliability and safety of the equipment shall be reported for corrective action.</p> <p>Equipment shall have data logged within 8 hours of being returned to service after service/repair, change of season start-up, etc.</p> <p>Equipment log shall record date (within 5 workdays) when equipment is removed from service for repairs, seasonal shutdown, etc.</p> <p>Each Equipment reset shall be recorded in the log, including the date, time and alarm conditions. Parameters shall be logged after the equipment has been reset and has reached stable operating conditions.</p> <p>Log Chillers daily during any periods in which the EMCS Host Visibility and Alarming is not available.</p>	4 Units	<p>Log Chillers weekly.</p> <p>Log shall be accurate and current, and shall be available for Government review upon request.</p> <p>Log shall be maintained on record for 24 months.</p>
5.4.4.2.2.3	Maintain a Log on Reciprocating Compressor Chiller parameters, during	The Contractor shall log operating parameters for Chillers. Logged data shall include entering/exiting water	21 Units	Log chillers monthly.

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	<p>operating periods.</p> <p>temperatures, amp readings, loading, oil pressures, oil level, refrigerant pressures, general conditions and observations, date and time, logging technician, and any other pertinent data.</p> <p>Logged data shall be reviewed for evidence of equipment deterioration. Conditions threatening the reliability and safety of the equipment shall be reported for corrective action.</p> <p>Equipment shall have data logged within 8 hours of being returned to service after service/repair, change of season start-up, etc.</p> <p>Equipment log shall record date (within 5 workdays) when equipment is removed from service for repairs, seasonal shutdown, etc.</p> <p>Each Equipment reset shall be recorded in the log, including the date, time and alarm conditions. Parameters shall be logged after the equipment has been reset and has reached stable operating conditions</p> <p>The Contractor shall log operating parameters for gas-fired boilers. Logged data shall include entering/exiting water temperatures, stack temperatures, flame color, general conditions and observations, date and time, logging technician, and any other pertinent data.</p> <p>Logged data shall be reviewed for evidence of equipment deterioration. Conditions threatening the reliability and safety of the equipment shall be reported for corrective action.</p> <p>Equipment shall have data logged within 8 hours of being returned to service after change of season start-up, service, repairs, etc.</p> <p>Equipment log shall record date (within 5 workdays) when equipment is removed from service for repairs, seasonal shutdown, etc.</p>	<p>5.4.4.2.2.4</p> <p>Maintain a Log on gas-fired boilers, during operating periods.</p>	<p>52 Units</p>	<p>Log Boilers Weekly.</p> <p>Log shall be accurate and current, and shall be available for Government review upon request.</p> <p>Log shall be maintained on record for 24 months.</p>

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5.4.4.2.2.5	Provide Quarterly Water Treatment Reports (DR 5-GA06)	The Report shall provide a quarterly report for each treated HVAC water system (e.g., cooling towers, chilled water and hot water loops). The report shall provide results of <u>all</u> sampling and tests, including chemical concentrations of corrosion inhibitors, biocides, algaecides, or other treatment chemicals, monthly average corrosion rates (for all open systems), along with any recommendations or conclusions. (See DR 5-GA06)	59 ea closed systems, 12 ea open systems	Conformance with DR.
5.4.4.2.2.6	Provide Annual NASA Refrigerant Inventory Report (DR 5-GA07)	The Report shall provide a listing by refrigerant type of the NASA owned Refrigerant Stock, for the Fiscal Year. The information shall include: 1.) Quantities at start of Fiscal Year. 2.) Quantities at the end of Fiscal Year. 3.) Refrigerant quantities, types and storage bottle numbers. (See DR 5-GA07)	1 Report	Conformance with DR.
5.4.4.2.3	Recurring Work			
5.4.4.2.3.1	Develop/Maintain HVAC and Refrigeration System Operation Manuals and SOPs (See DR 5-GA09)	Documentation shall be updated and maintained as required for the operation and maintenance of the HVAC and Refrigeration Systems. (See DR 5-GA09)	One annual revision.	Report shall be maintained on record for 36 months (minimum), and available for Government review upon request.
5.4.4.2.3.2	Support Freeze Plan	Monitor ambient temperatures and provide operations support as required in the SSC Freeze Plan (portion of DRI-GA03, Emergency Preparedness Plan of the **SSC	2 occurrences per year.	No instances of non-compliance with freeze plan.

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5.4.4.3	Operate all Plumbing	The Contractor shall operate all plumbing systems (potable water, sanitary sewage, natural,...) so that they meet the availability requirements and operational hours as designated in Annex 5.5 and the Operating Hours Summary, (**EMCS Operating Procedures**, available at the TRL).	Specified structures and facilities are identified in Section Exhibit 8.	Achieve the availability requirements given in Annex 5.5, Table 5.5-2, and operational hours as designated in the Operating Hours Summary (**EMCS Operating Procedure**, available at the TRL).
5.4.4.4	Operate Elevators	The routine and periodic inspections/tests for elevators are accomplished by Annex 5.2 Item Number 5.2.2.2.8.1.2. The Contractor shall accomplish any additional operations required to achieve the availability requirements and operational hours as designated in Annex 5.5 and the Operating Hours Summary (**EMCS Operating Procedures**, available at the TRL).	Contractor Determined	Achieve the availability requirements given in Annex 5.5, Table 5.5-2, and operational hours as designated in the Operating Hours Summary (**EMCS Operating Procedure**, available at the TRL).
5.4.4.5	Operate Built-In Cranes, Monorails, and Hoists	Provide operation of the Built-In Cranes, Monorails, and Hoists where the Contractor is listed as the responsible operator in the Inventory of Built-In Cranes, Monorails and Hoists (Exhibit 1). Operations shall be in accordance with **NSS/G0-1740.9 latest edition**.	See Exhibit 1, Inventory of Built-In Cranes Monorails, and Hoists. The Contractor only responsible for providing operations where the Inventory List shows the Contractor as the responsible operators.	Provide operations in accordance with **NSS/G0-1740.9**

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5.4.4.6	Operate Fire Protection & Alarm Detection Systems			Operate to achieve availability (Table 5.5-1)
5.4.4.6.1	Fire Protection & Alarm Systems	Consists of alarm panels.	91 Alarm Panels	See 5.4.4.6
5.4.4.6.2	Facility RF Transceivers	Part of the Fire Alarm System	89 RF Transceivers	See 5.4.4.6
5.4.4.6.3	Sprinkler & Suppression Systems	Systems consist of Sprinklers, foam, dry chemical and gas (CO ₂ and Halon), including piping, valves, tanks, pumps, gauges and associated equipment.	100 Sprinkler and 4 Suppression Systems	See 5.4.4.6
5.4.4.6.4	Fire Hydrants	Fire Hydrants include Post Indicator Valves.	139 Fire Hydrants and 16 Post Indicator Valves	See 5.4.4.6
5.4.5	Marine Operations	Marine Operations includes operation and operator maintenance of the Tugboat Clermont II, 3 work barges, navigation lock, bascule bridge, docks, navigational aids, mooring devices, monitoring and level control of the canal system, signage and the procurement and storage of marine materials and supplies required for day to day marine operations at SSC and when off-site. The canal waterway system consists of approximately 6 miles of canals. The level of the water in the canals is regulated by pumping water from the Pearl River system into the canal system through the use of 4 vertical pumps located at the West End of the lock. Operation of the pumps is required during extended periods of dry weather and when there is a lockage. The high water level of the canal system is controlled automatically by flow over a spillway.		See 5.4.4.6
	The tugboat Clemon II is used primarily to transport propellant barges from the loading docks on Propellant Boulevard to the test stands which is a trip of from 1 hour			

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to the B-Test Stand to 45 minutes to the A-1 and A-2 Test stands. The tug is also utilized to transport NASA owned barges to and from the Michoud facility in New Orleans, LA before and after hurricane season. Resident agencies are provided tugboat service on a time available basis.

The current method of propellant delivery is to load liquid oxygen and liquid hydrogen into their respective barges at the loading facilities on Propellant Boulevard and deliver them to the respective test stands. (Although the capability exists to transit to Air Products and Chemical Corp. in New Orleans, LA to pick up barge loads of liquid hydrogen, this method of delivery is not presently utilized.)

The lock is filled from the canal system through the use of "tainer valves" which are opened to fill the lock to the level of the canal system by gravity feed. The tainer valves can also be utilized to minimize spillway flow during periods of high rainfall. Tainer valves are also utilized to drain water from the lock into the Pearl River system so that the level of the lock matches that of the river system. The upper and lower gates of the lock are operated by hydraulic rams. The hydraulic pressure is furnished by electric/hydraulic pumps located in the lock equipment building. There is a separate lock control building for the upper and for the lower gates. During hurricane warning periods, commercial and privately owned boats are allowed into the lock for protection against the storm on a first come/first serve basis.

The Bascule Bridge is a twin span, 4-lane bridge, which is operated automatically by programmable logic controller. Manual operation is possible from the control building by trained and certified operators. The bridge has two

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		<p>variable speed electric motor/gear drives on each span. The bridge can be operated with one motor. The second motors are installed in each bridge span for redundant capability.</p>		
5.4.5.1	<p>Provide Marine Operations Plan (DR 5-GA11)</p> <p>Prepare a Marine Operations Plan for all facilities and equipment covered under this Annex. The Plan shall provide details as to how the Contractor intends to perform work necessary to meet all requirements for Marine Operations under this annex, including operations required to meet Availability as defined in Annex 5.5. This plan shall also address how the Contractor intends to meet personnel requirements, including certifications, training and special requirements to meet Coast Guard Regulations. Where operations require specific skills and/or certifications, the Contractor shall submit planned</p>	<p>One Plan</p> <p>Plan shall be submitted for CO concurrence within 60 days of contract award.</p>		

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5.4.5.2	Support the Tornado & Severe Weather Plan	Monitor weather conditions and provide operations support as required in the **Tornado and Severe Weather Plan (Annex A of the Disaster Preparedness Plan MA-05)** to implement the Plan. This is an annual plan required by DR 1-GA03	Anticipate 4 occurrences per year	No instance of non-support
5.4.5.3	Recurring Work			methods for addressing attrition and other contingency planning.
5.4.5.3.1	Operate Lock Control Equipment and Controls	Operate and provide operator maintenance of the lock hydraulic system including: pumps, motors, oil system, gate rams and entire piping and tubing systems as part of this hydraulic power system. Operation includes calibration and operation of controls, electrical and electronic devices and all devices associated with safe operation of the lock and lock control equipment.	30 times/yr (The lock control equipment shall be exercised no less frequently than once each month. Normal operation can be counted as part of this monthly minimum.)	The lock shall be able to perform its intended function within 2 hours of a request to operate it. The request may come from the Government, other contractors, or resident agencies.
5.4.5.3.2	Operate Navigation Lock	Operation of this facility shall include all events of opening and closing the lock, adjusting and maintaining the water level, operation of controls, operation of tainter valves and assisting in mooring boats and barges into and out of the lock. There is a special requirement to lubricate the pintal bearings of the lock gates every 30 days. This operation must be performed with the gates in motion to aid grease flow to the bearings. (Failure to perform this function will result in seizing of the bearings.) Operators shall be trained and certified in accordance with Annex 5.4.2.7 to operate this critical equipment. There will be a minimum of 30 lockages per year with approximately 5 of these occurring after hours. It is normal to have 24 hours	30 times/yr including maintenance and resident agency use.	The navigation lock shall be able to be operated (lock filled, water level adjusted to river level or canal level, and the gates operated within 2 hours of notification to operate.)

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5.4.5.3.3	Operate Bascule Bridge	<p>Operate the bascule bridge on request. Operators shall be trained and certified to operate this critical system. The bridge is of the bascule type and has North and South spans that are operated by electric motors which are assisted by counterweighing. The bridge controls are automatic through a programmable logic controller (PLC); however, the operators must be trained and certified to be able to operate the bridge in "manual" as well as "automatic" mode. The bridge is operated on demand for various test programs and resident agencies. It is normal practice to operate the bridge on demand except for the hours 6:30 am to 8:30 am and from 3:30 p.m. to 5:00 p.m. During these peak automobile traffic hours, auto traffic is given preference unless there is a critical programmatic requirement. The NASA Program Office for the test program affected or the Director of Center Operations and Support Directorate or the Director of the Propulsion Test Directorate will determine programmatic need. The bridge may be required to be opened up to 48 times per year of which 4 of these openings may be after hours. This includes requirements for maintenance.</p>	48 openings/yr	The bridge shall be able to be opened (at least one span) within 2 hours of notification.
5.4.5.3.4	Operate Tugboat Clermont II	<p>The Contractor shall assume complete operational control and authority for the NASA tugboat. The Contractor shall have a licensed Captain and boat driver(s) to perform work requirements on an as needed basis. The Captain shall assume full and unrestricted control of operational</p>	620 movements/yr	The tugboat shall be able to conduct barge movements during normal working hours with zero excursions. The
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	<p>decisions, scheduling in support of test programs and other requirements and be responsible to assure that the tug is maintained in accordance with Coast Guard regulations and standards for a marine vessel of this type and size.</p> <p>The tugboat shall be available to support the requirements of test programs and/or resident Agencies on as-needed basis. Historically, 90% of the annual requirements for barge relocations have been accomplished during the hours 5:00 am to 4:00 p.m. during normal weekdays.</p> <p>Approximately 10 of the anticipated 600 barge moves will be accomplished after normal working hours. Work that is started during normal working hours shall be completed even if it requires work past normal working hours.</p> <p>Workdays in excess of 12 hours continuous are anticipated to occur 10 times per year. Sufficient trained and certified personnel must be available to support 24 hr/day operations for periods up to 4 consecutive days. This extended work period may occur up to 4 times per year. If the hydrogen transfer facility on Propellant Blvd. is unable to transfer hydrogen to the barges for any reason, it is anticipated that barges will be pushed to Air Products and Chemical Corp. in New Orleans, LA, filled there and returned to SSC fully loaded. This round trip takes 15 to 20 hours and usually requires the marine crew to stay on the tugboat over night at Air Products. Night transits through the waterway system are discouraged due to safety considerations. It is likely that during good weather, two hydrogen barges can be pushed to Air Products at one time. This requires prior approval of the NASA Project Office or the CO. In addition to movement of the 3 liquid hydrogen and 6 liquid oxygen barges, the tug will be used to relocate the 3 work barges to be used for maintenance of the canal system. The tug will also be required to relocate barges from Michoud to SSC on</p>	<p>Contractor shall be able to support barge movement after normal working hours with two hours advanced notice with zero excursions allowed. In the event that the NASA tug cannot support barge movements due to mechanical malfunction or other unexpected event, the Contractor shall be able to supply alternate means to move barges within 48 hours of the time that the tug is determined to be unavailable for service.</p>		

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		demand and to assist other resident agencies at SSC.		
5.4.5.3.4.1	Operate Tugboat and other marine facilities to assist resident agencies and other contractors	<p>It is normal practice to assist resident agencies in the movement of material within the SSC waterway system and to and from Michoud. This is infrequent and is accomplished on a "time available" basis. On rare occasions the Contractor may be required to assist other contractors with movement of material on the waterway system when such movement would be considered in the best interest of the Government. This work will be on a time available basis. On an infrequent basis, the marine personnel are requested to act as pilots for boats transiting the Pearl River and SSC water systems. They are not to serve as licensed pilots, only as advisors.</p>	Contractor Determined	
5.4.5.4	Standing Work			
5.4.5.4.1	Operate Lock Pumping Station	<p>The Contractor shall operate the 4 vertical, electrically driven pumps to maintain the canal level above the lock between 16 feet 4 inches to 16 feet 6 inches, as measured at the gauge on the canal lock wall upstream of the upper gates. The canal level shall not be allowed to fall below 16 feet 0 inches because the cryogenic barges have a very limited ability to rise and fall with canal level changes. During periods of high rainfall, it shall be normal practice to open the tainer valve system in order to limit flooding below the spillway. The high level of water in the canal system is controlled by the spillway system. The pumps, once started, can operate unattended as long as the level of the canal is carefully observed and kept within the limits above. This building shall not be used for storage of supplies or materials of any kind with the exception of</p>	<p>Operate and provide operator maintenance on the pumping system 35 times/yr for approximately 8 hours each time.</p> <p>Operation of the tainer valves to control excessive rainfall (more than 6 inches of rainfall in any 24-hour period or a rainfall accumulation of 10</p>	

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5.4.5.4.2	Operate Lock Cathodic Protection System	The cathodic protection system, which protects the lock and bridge, shall be operated in accordance with standards set in Annex 5.2.2.8.4.7. This system operates unattended.	material needed on a daily basis to operate the pumps.	inches within any 3-day period) will occur 7 times per year.
5.4.5.4.3	Maintain Logs	The Contractor shall maintain a log at each location of the Bascule Bridge, and Lock. These logs shall provide historical information of openings, closings, maintenance activities performed with dates and times for all information.	2 logs	Nothing additional hours. Maintain operational settings per annex 5.2.2.2.8.4.7.
5.4.5.4.4	Maintain Log	The Contractor shall maintain a log on the bridge of the Tugboat Clermont II which provides dates and times of all maintenance activities, operational data, names of personnel doing work or operations and initialed by the Captain as being performed in accordance with regulations and other pertinent data. This log shall also show consumables usage, fueling records and any equipment, which is malfunctioning.	1 log	No outages exceeding 24 hours. Maintain operational settings per annex 5.2.2.2.8.4.7.
5.4.5.4.5	Submit Fuel Usage Report	The Contractor shall submit on a monthly basis a consumable usage report, which provides the amount of fuel used during the month. (See DR 5-GA18)	Monthly	Log shall be legible and complete in every detail of operation
5.4.6	Solid Waste Management			Report shall be submitted to the NASA CO before the 5 th working day after the end of each fiscal month. See DR 5-GA18
5.4.6.1	Refuse Collection – Standing Work			C-5.4

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5.4.6.1.1	Schedule Update Report, DR 5-GA12	Develop, submit, and maintain monthly schedule updates to verify compliance with Refuse Pickup Schedule.	Monthly	Nothing additional.
5.4.6.1.2	Collect Refuse from Non-bulk Containers	<p>The Contractor shall pick up solid waste containers at locations and frequencies listed in the Refuse Pickup Schedule (See Exhibit 9) and deliver to a permitted landfill. The Contractor shall visually inspect all containers before pick up to ensure there are no materials or components in the containers that are not on the refuse WIS. If unauthorized dumping is detected, report immediately to the SSC Environmental Officer. Collect refuse spilled from under and within 10 feet of containers and refuse spilled from collection vehicles.</p>	5,500 containers emptied annually	Empty containers during core hours. Return empty trashcans and lids to original position and location.
5.4.6.1.3	Pick Up Refuse from Containers Handled Mechanically for Disposal	<p>Containers holding 2 to 10 cubic yards are normally handled mechanically. A detailed listing of locations will be provided upon contract award. Provide an appropriate size container at the specific locations and establish a frequency of collection. Collect refuse spilled from, under, and within 10 feet of containers and refuse spilled from collection vehicles and deliver to a permitted landfill. Return containers to their original locations and ensure services are accomplished within the frequency of service parameters specified. NOTE: Quantities in individual containers will vary seasonally, and on occasion, special events/ circumstances (e.g., cardboard from deliveries, office moves, etc.) may inadvertently fill container before the anticipated collection date.</p>	11,800 containers emptied annually, with approximately 30 tons of waste weekly transported to the landfill	Empty containers as necessary to ensure that they do not exceed 90% capacity, develop obnoxious odors but not less than monthly.
5.4.6.1.4	Pick Up Cardboard from Container Areas	<p>The Contractor shall pick up cardboard from containers at Buildings 1100 (two locations), 2101, 1000, 2204, 1105, 2104/2105, 2201, 2205, 3202, 1005, and 8100. In addition, the Contractor shall collect cardboard from all</p>	12 locations with cardboard containers 36 to 48 tons of cardboard each year	Empty containers as necessary to ensure they do not exceed 90% capacity, but not less than monthly.

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5.4.6.2	Landfill Operations – Standing Work			other refuse collection points where quantities of cardboard are occasionally generated but do not warrant the installation of a container. Administration of cardboard recycling program is in Annex 7.0.
5.4.6.1	Class A Landfill and Class II Rubbish Landfill Operations	Operate in accordance with Landfill Operations Manual, Permit No. SW02401B0376, and the MDEQ **Non-hazardous Waste Management Regulations**.	Daily	Meet all requirements of Landfill Operations Manual, Permit No. SW02401B0376 and MDEQ Nonhazardous Waste Regulations.
5.4.6.2.3	Cardboard and Drum Compression	Compress all cardboard collected in 5.4.6.1.4, store and arrange for sale and/or recycling. Compress all previously rinsed drums in the drum crusher and place in the metal recycling program administered by requirements of Annex 7 and 9.	3 to 4 tons of cardboard per month; 100 drums on average per month	Less than 20% cardboard in debris/garbage disposed of in landfills. No drums in landfill except for unsalvageable crushed drums upon approval of SSC Environmental Officer.
5.4.6.2.3	Solid Waste Disposal Report, DR 5-GA13	Provide report per DR 5-GA13.	Monthly	Compliance with DR
5.4.7	Maintenance Engineering			
5.4.7.1	Personnel Qualifications, Roof Maintenance	Due to the criticality of the roofing systems, it is imperative that personnel assigned as craftsman and inspectors for roof maintenance be thoroughly familiar with repair procedures of the various systems. All inspectors and technicians, assigned to these positions must meet the Roofing Industry's Educational Institute	Contractor determined	Submit qualifications within first 60 days of contract start for inspectors and technicians.

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5.4.7.2	Provide Maintenance Engineering Support	Requirements for Roofer ID (3 years of specialized experience in repair and maintenance of the roofing system being repaired and inspected.)	At a minimum, Maintenance Engineers shall provide the following:	Contractor determined
5.4.7.3	Reserved			
5.4.7.4	Reserved			
5.4.7.5	Implement, manage and operate the existing Computerized Maintenance Management System (CMMS).	The CMMS software, workstation licenses, and maintenance history are Government owned and will be made available to the Contractor for the duration of the contract. The ADP hardware and software to support this	Contractor determined	The CMMS system shall be maintained in a manner that minimizes downtime.

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5.4.7.6	Establish a work management system for receiving, scheduling, tracking, and reporting all maintenance and repair work.	The system shall provide maximum visibility (Network online access) to all generated, scheduled, in-progress, and completed maintenance and repair work.	Contractor determined	Information shall be available for Government review 24 hours a day, 7 days a week.
5.4.7.6.1	Establish a central work control center for receiving maintenance and repair work.	Publish or otherwise notify customers of the location and phone number. Establish and publish a procedure for receiving calls outside normal business hours.	Contractor determined	Numbers shall be accounted for at all times.
5.4.7.6.2	Assign a work control number to maintenance and repair work received for tracking and reporting purposes.	Each occurrence of maintenance and repair work shall be assigned a unique number distinguishable for other service performed under the terms of this contract.	Contractor determined	Input is correctly completed with 24 hours of receipt of change.
5.4.7.6.3	Input and update data required for tracking of received or identified maintenance and repair work.	Include all information necessary to provide accurate network online visibility to all work. Update data whenever a change occurs, additional data becomes available or condition changes.	Nothing Additional	A complete audit trail shall exist for work performed on numbered equipment.
5.4.7.6.4	Track work accomplished on all numbered equipment in the CMMS database.	Includes all work covered under the terms of this contract; operation, standing work, etc. Provide accurate network online visibility.	Nothing Additional	Retag equipment that has missing or illegible tags.
5.4.7.6.5	Maintain CMMS Program identification on equipment.	Ensure equipment has a Maintenance ID tag attached. Ensure equipment has a corresponding ID in the CMMS database.	1 system	Place an equipment identification number on all new equipment.

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ITEM NO.	PERFORMANCE REQUIREMENT	RELATED REQUIREMENTS OR INFORMATION	WORKLOAD DATA	MINIMUM STANDARDS
5.4.7.6.6	Document all software procedures that are generated by the Contractor that customizes CMMS system.	The Contractor shall include in the documentation a description of the procedure and its purpose and interfaces.	Contractor determined	All documentation shall be up to date and available for review by the Government.
5.4.7.7	Maintain and operate existing, Government owned, P.T.&I. Program. (See Exhibit 3)	The Contractor shall maintain the existing software current or replace with new software if the vibration and/or thermography equipment is replaced with a different system. The systems in use at the end of the contract term shall be provided to the Government. (See Exhibit 3)	3 manyears per year Nothing additional	Nothing additional See Exhibit 3
5.4.7.8	Utilize and update the existing Government owned ROOFER software and database.	The ROOFER program, utilizing maintenance history, prioritizes roof maintenance requirements.	1 database	Complete and accurate database
5.4.7.9	Utilize and update the following system databases:	These databases provide information on the condition of specific facilities and systems and maintenance planning. Information contained in these databases shall be updated to reflect current conditions a determined by the Facility Inspection Program.	3 databases	Complete and accurate database
5.4.7.10	Schedules	The Contractor shall prepare the 3 month schedule for all Facility relamp database. Exterior paint database.		The schedule shall be

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ITEM NO.	PERFORMANCE REQUIREMENT	RELATED REQUIREMENTS OR INFORMATION	WORKLOAD DATA	MINIMUM STANDARDS
5.4.7.10.1	Prepare a 3 month schedule at the beginning of each month, available online	operation, recurring work, contractor generated work orders, preventive maintenance, and other SWR's. The schedule shall include the work order number, location (specific location description to permit the Government to inspect the work), start date, and end date.	12 schedules	updated the first of each month.
5.4.7.10.2	Prepare a weekly schedule, available online.	The Contractor shall prepare a weekly work schedule that covers the same types and categories of work as the three month schedule specified above and shall contain the same information.	52 schedules	The schedule shall be available online by 7:00 am, Friday for the following week. The schedule shall be updated as changes occur.
5.4.7.11	Collect and report historical information on trouble calls and all maintenance work orders. DR 5-GA23	Historical cost information, that summarizes the content of the maintenance work at SSC, shall be provided no later than October 15 for the previous fiscal year. This information shall be provided for review in online reports and retained in Central Engineering Files.	Historical: 6948 trouble calls for work FY97	No instance of undocumented trouble call
5.4.8	Operate the Installation-Accountable Government Property (IAGP)	Tables 5.4-2 and 5.4-3 provide the format and suggests the content required for each report. The Contractor shall provide this information by October 15, each year for the previous fiscal year.	Attachment J-10 List 1 and 2	No instance of improper operation of equipment.
5.4.8.1	Operate the Special Purpose Mobile Equipment (SPME)	All IAGP are to be used only to complete work under this contract. The use of Government furnished property and services for other purpose is prohibited. The contractor shall maintain all current calibrations and certifications, which might be required for this equipment. NASA's Test Area requirements shall have the highest priority in the use of all IAGP.	Exhibit 4	The Contractor is responsible to operate all Special Purpose Mobile Equipment in accordance with the Operator Maintenance Instruction for Special Purpose

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ITEM NO.	PERFORMANCE REQUIREMENT	RELATED REQUIREMENTS OR INFORMATION	WORKLOAD DATA	MINIMUM STANDARDS
5.4.9	Provide Non-destructive Evaluation Service Capability (NDE)	<p>Mobile Equipment (SPME) No. OMI-FSD-001.</p> <p>The Contractor shall also be responsible for refueling any or all of these items which are engine-driven, as necessary, to maintain this readily available condition.</p> <p>NDE includes extensive capabilities in the area of inspection and evaluation services. These capabilities must be readily available and be of state-of-the-art capability. The services required include such items as the following: leak inspections by mass spectrometer, radiograph filming and interpretation, ultrasonic examination, borescope inspection, magnetic particle inspection, dye penetrate inspection, hardness determination, radiation safety and other inspection and evaluation work.</p> <p>The work includes capability to inspect welds up to 6 inches in thickness, pressure vessel certification, failure prediction, failure evaluation, corrosion detection and evaluation, leakage rate evaluation during component testing in the shops and in the field, and a multitude of other inspection efforts required to support cryogenic and high pressure gas systems and equipment operations. This capability extends to inspection of "flight" hardware as determined by the customer.</p> <p>This performance requirement also includes the cost to maintain radiation sources including high-energy cobalt source, and the licenses to maintain this capability.</p> <p>The maintenance of all NDE equipment, license fees, and all other costs associated with maintaining this capability in a high state of availability are included in this Annex.</p>		

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5.4.10.1	Establish and Implement an Energy Management Program to ensure	The Contractor shall propose an Energy Management Plan that accomplishes the end results of:	2 licenses See Table 5.4-1	Licenses must be current and comply with State regulations.
5.4.10	Energy Management	Pressure vessel inspection is performed on all pressure vessels in accordance with the **NASA Pressure Vessel Recertification Program ** .	Contractor shall respond to request within 1 hour of notification of requirement. Results of inspection shall be submitted within 24 hours.	Initial plan to be approved and in place within 180

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<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARDS</u>
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compliance with Federal Laws and Executive, Agency and Center Mandates for SSC (DR 5-GA22)

The plan shall implement the energy resource management goals established by the National Energy Conservation Policy Act (NECPA), as amended, and Executive Orders 12759 and 12902. These goals include a 20% reduction in energy consumption per square feet of building by FY 2000 and a 30% per cent reduction by FY 2005 as measured from the base year of FY 1985.

Additionally, the plan shall implement the ****SSC Utilities Energy Consumption and Cost Allocation**

Procedures** in accordance with NHB 8831.2A Facilities Maintenance and Energy Management Handbook. The plan shall describe how the Contractor will achieve energy management for all Performance requirements. The plan shall be inclusive of new designs, renovations, equipment replacements, procurements of energy goods or equipment and operations and maintenance of Utility Systems. Life-Cycle Costs (LCC) as defined in **10 CFR 435 and 436** shall be integral part of plan.

A certification process must be included in the program which ensures compliance of design, construction, installation and operation with Federally Mandated Standards including ****10 CFR 435 and 436****.

5.4.10.2 Provide the Energy Consumption and Cost Reports in accordance with DR 5-GA18

Submit to SSC's Energy Manager

See DR 5-GA18

Timely, accurate and complete reporting.

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TABLE 5.4-1

**NONDESTRUCTIVE TESTING
HISTORICAL WORK EFFORT**

NDT METHOD	TYPE	FY97	FY98	FY99 (ESTIMATED)
Leak Inspections	Unit	3751	2760	510
Visual Inspections	Unit	3920	4825	975
Radiographs Interpreted	Unit	1711	4047	859
Radiographs Produced	Unit	4380	3729	774
Radiography Preparation	Hours	380	463	82
Equipment Maintenance	Hours	289	423	36
Pressure Vessel Periodic Inspections	Unit	70	271	29
Pressure Vessel Recertifications	Unit	4	13	2
Ultrasonic Inspections	Unit	427	628	176
Ultrasonic Preparation	Hours	21	30	7
Boroscope Inspections	Unit	59	267	43
Magnetic Particle Inspections	Feet	147	451	83
Dye Penetrant Inspections	Feet	790	507	540
Eddy Current Inspections	Unit	18	7	2
Hardness Inspections	Unit	120	1	1
Helium Mass Spec Inspections	Unit	413	237	9
Radiation Safety	Hours	320	398	99
NDT Overtime Worked	Hours	848	1838	328
		17,668	20,895	4,555

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TABLE 5.4-2

TABLE 5.4-3

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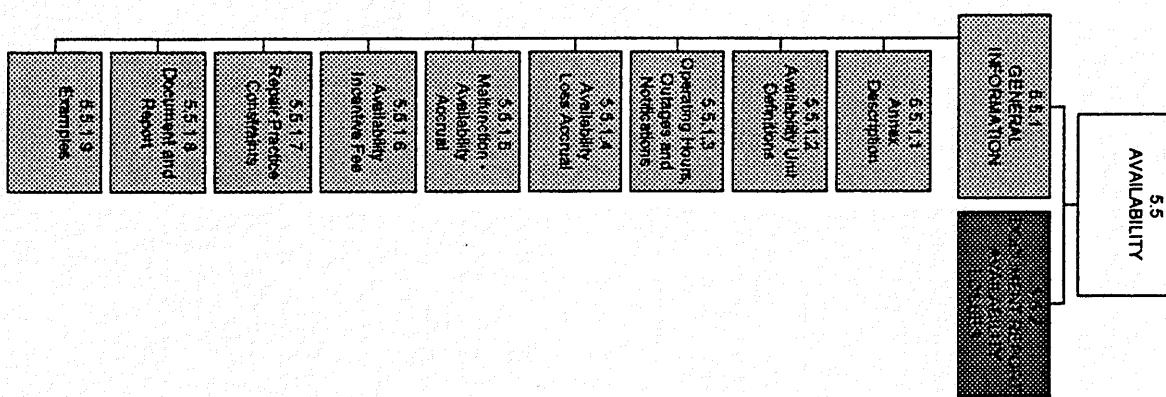
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Total number of trouble calls by building:

Total number of work orders, other than trouble calls, by building:

Provide the following historical information for ALL work orders other than trouble calls, including IDIQ delivery orders:

WORK ORDERS other than trouble calls	NASA BASE SIDE	NASA TEST COMPLEX	NASA E- COMPLEX	NAVO	NRL	NDBC	USGS	TOTAL	Average Material Cost
\$0-\$500									
\$501-\$1000									
\$1001-\$2000									
\$2001-\$4000									
\$4001-\$6000									
\$6001-\$8000									
\$8001-\$10000									
\$10001-\$15000									
\$15001-\$20000									
Over \$20000									



ANNEX 5.5 AVAILABILITY

5.5 AVAILABILITY

5.5.1 General Information

5.5.1.1 Annex Description

This Annex identifies the Availability requirements for Structures, Facilities, Utility Systems/Subsystems and Installation-Accountable Government Property (SFUSS & IAGP) (See 5.1.2). Availability is defined as the ability of SFUSS & IAGP to perform its intended function and deliver intended output during operating periods. The Government has adopted availability units as described in Table 5.5-1. A malfunction is defined as an event in which a SFUSS & IAGP fails to properly operate or losses intended redundancy, but which does not prevent the system from performing its intended function. The operational periods are defined in the Building Operating Hours Summary of the **EMCS Operating Instructions** (available at the TRL); this is defined as the times for which the SFUSS & IAGP are required to perform intended functions by providing the specified output or redundancy function. Malfunction, response time, and repair time allowances are described in Table 5.5-2.

Table 5.5-1 describes and defines availability units and their criticality level. The Critical Systems Lists and the Critical Systems Line Drawings (found in the **SSC Utility RCM Analysis Manuals** for specified equipment and systems) identifies the criticality for each utility distribution system, subsystem and/or part of a subsystem. The MAXIMO Equipment Database identifies the criticality for numbered equipment items. Definitions for Criticality levels are provided in Annex 5.1.

5.5.1.3 Operating Hours, Outages and Notifications

PM, operations, or other activities which require "off time, down time or outages" of SFUSS & IAGP, shall be scheduled during the non-operating hours of the affected building/facility, area or equipment as defined in the Building Operating Hours Summary **EMCS Operating Procedures** (available at the TRL). Where operating hours are continuous, or where activities can not be accomplished within non-operating hours, the

Contractor shall be responsible to provide temporary services or otherwise ensure that site/facility activities are not interrupted see Annexes 5.2 and 5.3). Activities requiring temporary services shall be coordinated with the affected customer and shall receive concurrence of the CO prior to commencement of work. Where interruption of site/facility activities is unavoidable, or where temporary services are not feasible, prior concurrence of the CO shall be requested; where concurrence is provided, the Contractor will not accrue an availability loss.

All scheduled "off time/down time," whether off time is during or after normal working hours shall be coordinated with affected customer. Failure to coordinate and to provide 24 hours (minimum) notification shall result in availability loss (See Annexes 5.2, 5.3 & 5.4). Such notification shall provide the affected parties sufficient information and time to prepare for outages or request rescheduling of activities.

5.5.1.4 Availability Loss Accrual

Availability losses will be accrued due to unavailability of SFUSS & IAGP that are a result of PM, operations, CM, construction or other activities within the control of the contractor. Accrual of availability losses does not diminish the right of the Government to impact incentives applicable to other annexes of this contract. Example: Failure to perform a required PM results in the loss of output of a utility system as defined in Table 5.1-1. An availability loss shall be accrued per the applicable system or equipment item as defined in this Annex; the incentive fee may be affected for non-performance of the applicable PM line item in Annex 5.2.

An availability loss shall be accrued each time a SFUSS & IAGP fails to be available during a performance period. There is no limit on the quantity of availability losses that may be accrued against any SFUSS & IAGP. Example: An equipment item experiences an availability loss and is repaired/restored to operation within the designated repair time. The equipment subsequently experiences a second availability loss. A total of 2 availability losses shall be accrued against the equipment item.

Allowed time for response and repair is provided in Table 5.5-2, for which failure to meet will result in accrual of an additional availability loss. After the allowed repair time lapses, an additional availability loss shall be

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accrued every 24 hours until the repair is completed. Example: A Criticality Level II system with redundancy (7-day designated repair time) experiences an availability loss. The repair is completed on the 10th day following the loss. This incident shall result in accrual of 4 Availability Losses. The first is accrued for the initial loss of availability, the second is accrued on the 8th day for failure to meet the repair time, the third and fourth are accrued on the 9th and 10th days respectively.

Where the repair time constraints can not be met, the contractor may establish temporary services to temporarily restore availability. In such cases, the contractor shall obtain CO concurrence on the method and the maximum time for which temporary services will be in use. Continued operation of temporary service beyond the concurred time allowance will result in accrual of a malfunction (unless prior concurrence of the CO is obtained). An additional malfunction will be accrued every 5 days until the system availability is restored, or CO concurrence is obtained on the continuation of temporary services. Costs for approved temporary services are covered under CM (See Annex 5.3).

5.5.1.5 Malfunction-Availability Accrual

Table 5.5-2 provides Malfunction Conversion and Response/Repair Time Requirements values for each SFUSS & IAGP Criticality Class Code. Each time the quantity of malfunctions occurring for an individual Availability Unit reaches the malfunction conversion value, an availability loss will be accrued. Example: A total of 12 malfunctions occur on a Criticality I Availability Unit. This shall result in accrual of 4 availability losses against Criticality level I (from Table 5.5-2, Malfunction-Availability Equivalent is 3, therefore 12 malfunctions divided by 3 is equal to 4 availability losses).

A malfunction will be accrued toward defined availability units (Table 5.5-1) each time a malfunction occurs. The allowed time for response and repair is provided in Table 5.5-2, for which failure to meet shall result in accrual of an additional malfunction. After the allowed repair time has lapsed, an additional malfunction shall then be accrued every 24 hours until the repair is completed.

At times a malfunction or loss of one unit may result in loss of availability of one or more other availability units. In such cases, either a malfunction

shall be applied to the system which experienced the malfunction, or an availability loss shall be accrued against one (and only one) of the units which experienced a loss of availability. Selection of either option is at the Government's discretion (See example 5 in 5.5.1.9). It is also the Government option as to which affected system accrues the availability loss.

5.5.1.6 Availability Incentive Fee

Table 5.5-3 defines the incentive fee that will be awarded to the Contractor upon accomplishing the designated levels of availability. Availability losses within each SFUSS & IAGP Criticality Class Code will be totaled for each performance period (12 months). The incentive will then be determined based on ranges of availability losses as presented in Table 5.5-3.

Maintaining SFUSS & IAGP availability is a contractual requirement and a primary responsibility of the Contractor. In such cases that the incentive fee within a criticality level may have been lost during a given performance period, the Contractor is still obligated to work diligently in maintaining SFUSS & IAGP availability, without regard to the incentive fee status.

5.5.1.7 Repair Practice Constraints

The Contractor is expected to be resourceful in meeting the repair time constraints, by using such methods as maintaining inventory of commonly used parts/supplies, expeditious purchase/delivery of parts, development of service contracts, use of temporary services, etc. Where a repair can not be accomplished within the allowed time constraints (due to circumstances beyond the control of the Contractor), and where temporary services are not feasible, the Contractor may obtain relief through a special written request to the CO for a Continuance. Where approved, the Contractor will not accrue availability losses for failure to meet repair times. Such requests shall be accompanied by sufficient detailed information to demonstrate, and allow the Government to verify, that the Contractor exercised reasonable effort to accomplish the repair within the designated time constraints. Approval is strictly at the discretion of the CO; the burden of proof resides with the Contractor. The Contractor must also demonstrate a continuing effort to expedite the repair; failure to expedite may result in cancellation of the Continuance. Submittals for a Continuance shall include

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a listing of repair parts, descriptions of work involved, extensive listings of suppliers (along with names, dates and phone numbers) contacted for parts/services, an explanation of the circumstances necessitating the Continuance, and a repair plan, with projected completion date. The Contractor shall not cannibalize site equipment in order to obtain repair parts. However, in emergency cases, where timely delivery of parts is not possible, or parts are not available, relief from this requirement may be obtained through the Supply and Equipment Management Officer's concurrence in accordance with **NASA Handbook 4200**. The NASA Form 1617 shall be utilized to record the circumstances and approvals for this action.

The Contractor may obtain spare parts inventory (which shall be used for SSC SUFUS & IAGP only) through cannibalizing site equipment determined to be "scrap or salvage" in accordance with **NASA Handbook 4300 NASA Personal Property Disposal Manual**. The NASA Form 1617 shall be utilized to record the circumstances and approvals for this action. Approval of any cannibalization is strictly at the discretion of the Government, and is subject to NASA standards regulating cannibalization. An inventory shall be maintained on such parts, and the inventory and parts shall be turned over to the Government at the end of the contract.

5.5.1.8 Document and Report

The Contractor shall document and maintain cumulative records (for each contract year) of all malfunctions and availability losses. Records shall be sufficient such that the Government can determine the date, time, duration, equipment, systems, building, type of malfunction/failure, cause, etc. Malfunctions and availability losses shall be reported to the Government per Annex 5.5.2.

5.5.1.9 Examples

The following examples are presented in order to clarify the accrual of availability losses and malfunction of various equipment and systems (also, see examples in previous sections of this annex). The Government neither guarantees nor implies that these examples provide a comprehensive list covering all potential situations, circumstances or scenarios that may occur.

EXAMPLES:

1. The primary pump in a sewage lift station fails; the secondary pump is able to handle the flow, and the lift station continues to perform its intended function. Then, a malfunction count of one would be accrued toward that specific availability unit (i.e., the lift station). In example #1 the repair is completed and the lift station is restored to normal operation, then subsequently that pump or any other lift station component causes another malfunction. Another malfunction would be accrued against that availability unit.
2. The potable water system during normal operations is supplied water from two well house systems, and a third well house system is available as backup. If one of the operational well house systems fails and the potable water system output continues (i.e., pressure and flow are maintained per output requirements of this contract), then a malfunction count of one (1) would be accrued toward the potable water system. If all three well house systems fail, including the backup, but system output remains, then a malfunction count of three (3) would be accrued toward the system.
3. The condenser water pump fails, resulting in loss of an entire building chilled water system. One (1) availability loss would be accrued toward that chilled water system.
4. A construction activity under the direction of the Contractor damages a pipe serving make-up water to a mechanical room, resulting in loss of chilled water system and the hot water system during occupied periods of served buildings/areas. It is the Government's option as to which of the following would occur: Either one (1) malfunction would be accrued against the appropriate water piping system, one (1) availability loss would be accrued toward that chilled water system, or one (1) availability loss would be accrued toward the hot water system. It is most likely that one of the latter two choices would be selected.
5. A pump bearing failure is detected through a PM or other activity prior to pump failure. An outage is coordinated, scheduled and receives CO concurrence. The system is then taken off-line, the repair completed

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and the system restored to operation. No availability loss or malfunction would be accrued.

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ITEM NO.	PERFORMANCE REQUIREMENT	RELATED REQUIREMENTS OR INFORMATION	WORKLOAD DATA	MINIMUM STANDARDS
5.5.2	Document and Report Availability Losses (DR 5-GA08)	<p>The Contractor shall document and maintain cumulative records on all malfunctions and availability losses for each availability unit (as defined in Table 5.5-1). Records shall be available on electronic format, and shall be sufficient such that the Government can determine the date, time, equipment, systems, building, type of malfunction/failure, cause, repair time, etc. Electronic format shall allow sorting by building, system, equipment number (where applicable) or date.</p> <p>Malfunctions and availability losses shall be reported per DR 5-GA08</p>	ALL SFUSS & IAGP	<p>Records shall be maintained accurate and current, and available for Government review upon request.</p> <p>Reports shall be accurate and timely.</p>

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TABLE 5.5-1

SYSTEM	SYSTEM DEFINITION	AVAILABILITY UNIT DESCRIPTION	UNIT QTY	CRITICALITY LEVEL
ELECTRICAL 13.8 KV	See Table 5.1-1 # E1	Electrical 13.8 KV Main Substation	1	I
ELECTRICAL 13.8 KV	See Table 5.1-1 # E2	Electrical 13.8 KV Distribution, Circuits 11/21, 12/22, and 14/24.	6	II
ELECTRICAL 13.8 KV	See Table 5.1-1 # E4,E5,E6, & E7 See Table 5.1-1 # E4, E5, E6, & E7 See Table 5.1-1 # E3	Electrical 13.8 KV Substation Electrical 13.8 KV Substation Exterior Lighting System Electric Meters	2	I
POTABLE WATER	See Table 5.1-1 # E1, E2, E5 & E7	Potable Water Distribution System SSC Utility RCM Analysis Manual Line Drawings *	1**	I
POTABLE WATER	See Table 5.1-1# C1 and SSC Utility RCM Analysis Manual Line Drawings *	Potable Water Distribution System SSC Utility RCM Analysis Manual Line Drawings *	1**	II

** - Consists of all segments and components which are assigned this criticality by the SSC Utility RCM Analysis Manuals (e.g., All components colored as Criticality Level II are considered as 1 system).

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TABLE 5.5-1

SYSTEM	SYSTEM DEFINITION	AVAILABILITY UNIT DESCRIPTION	UNIT QTY	CRITICALITY LEVEL
POTABLE WATER	See Table 5.1-1 # C1 and SSC Utility RCM Analysis Manual Line Drawings *	Potable Water Distribution System	1**	III
POTABLE WATER	See Table 5.1-1 # C1 and SSC Utility RCM Analysis Manual Line Drawings *	Potable Water Distribution System	1**	IV
POTABLE WATER	See Table 5.1-1 # C1 and SSC Utility RCM Analysis Manual Line Drawings *	Potable Water Distribution System	1**	V
POTABLE WATER	See Table 5.1-1 # C2, C3, & C5	Well house complex # 1, 2, & 3 (includes well, pumps, chlorine treatment, meter, etc.)	4	III
POTABLE WATER	See Table 5.1-1 # C4	Pumphouse Complex # 3	3	III
SANITARY SEWAGE	See Table 5.1-1 # C6 and SSC Utility RCM Analysis Manual Line Drawings *	Water storage system - Elevated Tanks # 1, 2, & 3	3	III
SANITARY SEWAGE	See Table 5.1-1 # C6 and SSC Utility RCM Analysis Manual Line Drawings *	Sewage Collection System (Does not include Lift Stations)	1**	I
SANITARY SEWAGE	See Table 5.1-1 # C6 and SSC Utility RCM Analysis Manual Line Drawings *	Sewage Collection System (Does not include Lift Stations)	1**	II
SANITARY SEWAGE	See Table 5.1-1 # C6 and SSC Utility RCM Analysis Manual Line Drawings *	Sewage Collection System (Does not include Lift Stations)	1**	III
SANITARY SEWAGE	See Table 5.1-1 # C6 and SSC Utility RCM Analysis Manual Line Drawings *	Sewage Collection System (Does not include Lift Stations)	1**	IV

** - Consists of all segments and components which are assigned this criticality by the SSC Utility RCM Analysis Manuals (e.g., All components colored as Criticality Level II are considered as 1 system).

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TABLE 5.5-1

SYSTEM	SYSTEM DEFINITION	AVAILABILITY UNIT DESCRIPTION	UNIT QTY	CRITICALITY LEVEL
SANITARY SEWAGE	See Table 5.1-1 # C6 and SSC Utility RCM Analysis Manual Line Drawings *	Sewage Collection System (Does not include Lift Stations)	1**	V
SANITARY SEWAGE	See Table 5.1-1 # C6 and SSC Utility RCM Analysis Manual Line Drawings *	Sewage Collection System Lift Stations - SSC Utility RCM Analysis Manual Criticality Code I	4	I
SANITARY SEWAGE	See Table 5.1-1 # C6 and SSC Utility RCM Analysis Manual Line Drawings *	Sewage Collection System Lift Stations - SSC Utility RCM Analysis Manual Criticality Code II	19	II
SANITARY SEWAGE	See Table 5.1-1 # C6 and SSC Utility RCM Analysis Manual Line Drawings *	Sewage Collection System Lift Stations - SSC Utility RCM Analysis Manual Criticality Code III	4	III
SANITARY SEWAGE	See Table 5.1-1 # C6 and SSC Utility RCM Analysis Manual Line Drawings *	Sewage Collection System Lift Stations - SSC Utility RCM Analysis Manual Criticality Code IV	17	IV
SANITARY SEWAGE	See Table 5.1-1 # C6 and SSC Utility RCM Analysis Manual Line Drawings *	Sewage Collection System Lift Stations - SSC Utility RCM Analysis Manual Criticality Code V	8	V
SANITARY SEWAGE	See Table 5.1-1 # C7	Sewage Treatment Lagoon	2	I
SANITARY SEWAGE	See Table 5.1-1 # C8	Rock-Reed System	2	I
SANITARY SEWAGE	See Table 5.1-1 # C9	Septic Tank/Field Drain System	3	IV
EMCS	See Table 5.1-1 # 11	System 600 Host System and Equipment	1	III

** - Consists of all segments and components which are assigned this criticality by the SSC Utility RCM Analysis Manuals (e.g., All components colored as Criticality Level II are considered as 1 system).

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TABLE 5.5-1

SYSTEM	SYSTEM DEFINITION	AVAILABILITY UNIT DESCRIPTION	UNIT QTY	CRITICALITY LEVEL
EMCS	See Table 5.1-1 # 11	Field Control Cabinets (FID's, MBC's, SCU's and UC's)	2	I
EMCS	See Table 5.1-1 # 11	Field Control Cabinets (FID's, MBC's, SCU's and UC's)	23	II
EMCS	See Table 5.1-1 # 11	Field Control Cabinets (FID's, MBC's, SCU's and UC's)	35	III
EMCS	See Table 5.1-1 # 11	Field Control Cabinets (FID's, MBC's, SCU's and UC's)	107	IV
EMCS	See Table 5.1-1 # 11	Field Control Cabinets (FID's, MBC's, SCU's and UC's)	1	V
FUEL MANAGEMENT	See Table 5.1-1 # 12	Fuel Management Monitoring System	1	V
NATURAL GAS SYSTEM	See Table 5.1-1 # C10 and SSC Utility RCM Analysis Manual Line Drawings *	The Natural Gas System	1**	II
NATURAL GAS SYSTEM	See Table 5.1-1 # C10 and SSC Utility RCM Analysis Manual Line Drawings *	The Natural Gas System	1**	IV
NATURAL GAS SYSTEM	See Table 5.1-1 # C10 and SSC Utility RCM Analysis Manual Line Drawings *	The Natural Gas System	1**	V

** - Consists of all segments and components which are assigned this criticality by the SSC Utility RCM Analysis Manuals (e.g., All components colored as Criticality Level II are considered as 1 system).

ANNEX 5.5
AVAILABILITY
TABLE 5.5-1

SYSTEM	SYSTEM DEFINITION	AVAILABILITY UNIT DESCRIPTION	UNIT QTY	CRITICALITY LEVEL
INTERIOR ELECTRICAL	See Table 5.1-1 # E8	Includes Electrical panels, wiring, outlets, transformers, and appurtenances within a facility	10	I
INTERIOR ELECTRICAL	See Table 5.1-1 # E8	Includes Electrical panels, wiring, outlets, transformers, and appurtenances within a facility	363	II
INTERIOR ELECTRICAL	See Table 5.1-1 # E8	Includes Electrical panels, wiring, outlets, transformers, and appurtenances within a facility	481	III
INTERIOR ELECTRICAL	See Table 5.1-1 # E8	Includes Electrical panels, wiring, outlets, transformers, and appurtenances within a facility	503	IV
INTERIOR ELECTRICAL	See Table 5.1-1 # E8	Includes Electrical panels, wiring, outlets, transformers, and appurtenances within a facility	193	V
INTERIOR LIGHTING	See Table 5.1-1 # E9	Includes all lighting fixtures, bulbs and accessories within a facility	147	III
EMERGENCY LIGHTING	See Table 5.1-1 #E10	Includes all lamps, reflectors, ballast, lens, emergency power supplies, wiring, and associated hardware within a facility	91	I
UPS	See Table 5.1-1 # E14	Includes UPS equipment, batteries, instrumentation and appurtenances	3	I
UPS	See Table 5.1-1 # E14	Includes UPS equipment, batteries, instrumentation and appurtenances	18	II
UPS	See Table 5.1-1 # E14	Includes UPS equipment, batteries, instrumentation and appurtenances	18	III
UPS	See Table 5.1-1 # E14	Includes UPS equipment, batteries, instrumentation and appurtenances	2	IV
GENERATOR	See Table 5.1-1 # E11	Includes Emergency Generators, fuel tanks, instrumentation/controls and appurtenances	2	I

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ANNEX 5.5
AVAILABILITY
TABLE 5.5-1

SYSTEM	SYSTEM DEFINITION	AVAILABILITY UNIT DESCRIPTION	UNIT QTY	CRITICALITY LEVEL
GENERATOR	See Table 5.1-1 # E11	Includes Emergency Generators, fuel tanks, instrumentation/controls and appurtenances	9	II
GENERATOR	See Table 5.1-1 # E11	Includes Emergency Generators, fuel tanks, instrumentation/controls and appurtenances	25	III
GROUNDING & PROTECTION	See Table 5.1-1 # E12, E13	Includes Lightning Protection, Surge Protection and Grounding	147	I
CHILLED WATER & HEATING WATER SYSTEM	See Table 5.1-1 # M1	Includes chillers or boilers, pumps, piping, instrumentation, and peripheral equip.	10	II
CHILLED WATER & HEATING WATER SYSTEM	See Table 5.1-1 # M1	Includes chillers or boilers, pumps, piping, instrumentation, and peripheral equip.	18	III
CHILLED WATER & HEATING WATER SYSTEM	See Table 5.1-1 # M1	Includes chillers or boilers, pumps, piping, instrumentation, and peripheral equip.	2	IV
CHILLED WATER & HEATING WATER SYSTEM	See Table 5.1-1 # M1	Includes chillers or boilers, pumps, piping, instrumentation, and peripheral equip.	30	V
AIR HANDLING EQUIPMENT	See Table 5.1-1 # M1	Includes AHUs, HVUs, CRUs, DX units, RTUs, fans, blowers, hoods, unit heaters, instrumentation and peripheral equip.	2	I
AIR HANDLING EQUIPMENT	See Table 5.1-1 # M1	Includes AHUs, HVUs, CRUs, DX units, RTUs, fans, blowers, hoods, unit heaters, instrumentation and peripheral equip.	170	II
AIR HANDLING EQUIPMENT	See Table 5.1-1 # M1	Includes AHUs, HVUs, CRUs, DX units, RTUs, fans, blowers, hoods, unit heaters, instrumentation and peripheral equip.	343	III
AIR HANDLING EQUIPMENT	See Table 5.1-1 # M1	Includes AHUs, HVUs, CRUs, DX units, RTUs, fans, blowers, hoods, unit heaters, C-5.5	390	IV

ANNEX 5.5
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TABLE 5.5-1

SYSTEM	SYSTEM DEFINITION	AVAILABILITY UNIT DESCRIPTION	UNIT QTY	CRITICALITY LEVEL
AIR HANDLING SYSTEMS	See Table 5.1-1 # M1	instrumentation and peripheral equip. Includes AHUs, HVUs, CRUs, DX units, RTUs, fans, blowers, hoods, unit heaters, instrumentation and peripheral equip.	653	V
REFRIGERATION APPLIANCES & COOLERS	See Table 5.1-1 # M1	Includes equipment, instrumentation and appurtenances	5	II
REFRIGERATION APPLIANCES & COOLERS	See Table 5.1-1 # M1	Includes equipment, instrumentation and appurtenances	17	III
REFRIGERATION APPLIANCES & COOLERS	See Table 5.1-1 # M1	Includes equipment, instrumentation and appurtenances	1	IV
REFRIGERATION APPLIANCES & COOLERS	See Table 5.1-1 # M1	Includes equipment, instrumentation and appurtenances	13	V
INTERIOR POTABLE WATER	See Table 5.1-1 # C1	Includes distribution piping, valves, pumps, fixtures and appurtenances within a facility	147	IV
INTERIOR SANITARY SEWER	See Table 5.1-1 # C6	Includes distribution piping, pumps, instrumentation and appurtenances within a facility	147	IV
INTERIOR NATURAL GAS	See Table 5.1-1 # C10	Includes distribution piping, valves, regulators and appurtenances within a facility	37	IV
ELEVATORS	See Table 5.1-1 # O1	Includes elevator architectural/structural, mechanical, instrumentation and appurtenances	21	I
ELEVATORS	See Table 5.1-1 # O1	Includes elevator architectural/structural, C-5.5	21	II

ANNEX 5.5
AVAILABILITY

TABLE 5.5-1

SYSTEM	SYSTEM DEFINITION	AVAILABILITY UNIT DESCRIPTION	UNIT QTY	CRITICALITY LEVEL
ELEVATORS	See Table 5.1-1 # O1	mechanical, instrumentation and appurtenances	21	III
ELEVATORS	See Table 5.1-1 # O1	Includes elevator architectural/structural, mechanical, instrumentation and appurtenances.	21	IV
ELEVATORS	See Table 5.1-1 # O1	Includes elevator architectural/structural, mechanical, instrumentation and appurtenances	21	V
BUILT-IN CRANES	See Table 5.1-1 # O1	Includes all Built-In Cranes, Monorails, and Hoists	62	I
FIRE DETECTION AND ALARM	See Table 5.1-1 # E15	Alarm Systems for Fire Detection and Security for each facility throughout the site.	79	I
FIRE PROTECTION SYSTEM	See Table 5.1-1 # E16	Facility Fire Protection System provides for fire protection at each facility.	56	I
MARINE	See Table 5.1-1 # MO1	Marine Tugboat (Clermont II)	1	I
MARINE	See Table 5.1-1 # MO1	Bascule Bridge	1	I
MARINE	See Table 5.1-1 # MO1	Navigation Lock	1	I
MARINE	See Table 5.1-1 # MO1	Canal System, Waterway Dolphins, Docks, Mooring Devices & Navigation Aids	1	II
MARINE	See Table 5.1-1 # MO1	Marine Equipment	25	IV
MARINE	See Table 5.1-1 # MO1	Safety devices, Equipment	All	I
MARINE	See Table 5.1-1 # MO1	Piers, Canal banks, Drainage Systems	All	V
FCPF	See Annex 5.6.2.3	Clean Line	1	IV
FCPF	See Annex 5.6.2.3	Clean Room	1	IV

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ANNEX 5.5
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TABLE 5.5-1

SYSTEM	SYSTEM DEFINITION	AVAILABILITY UNIT DESCRIPTION	UNIT QTY	CRITICALITY LEVEL
FCPF	See Annex 5.6.2.3	Valve Testing Systems	2	IV
FCPF	See Annex 5.6.2.3	Tagged Equipment	Var.	IV
FCPF	See Annex 5.6.2.3	Freon stills	2	IV
FCPF	See Annex 5.6.2.3	Tubing Manufacturing	Var.	IV
FCPF	See Annex 5.6.2.3	Special tooling, equipment	Var.	IV
MACHINE SHOP	See Annex 5.6.2.2	All machine equipment, See Table 5.6-3	Var.	IV
FABRICATING SHOP	See Annex 5.6.2.1	All fabricating equipment, welding machines, and special tooling. See Table 5.6-1	Var.	IV
NDE	See Annex 5.4.9	All equipment, See Table 5.4-1	Var.	IV

NOTES:

- * - SSC Utility RCM Analysis Manuals contain utility system line drawings, which provide information on system components locations, quantities and criticalities.

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AVAILABILITY

Table 5.5-2

“Malfunction Conversion & Response/Repair Time Requirements”

Criticality Level	Malfunction - Availability Equivalent ①	Max Response Time 7 a.m. – 5 p.m., Mon – Fri ②⑥	Max Response Time All Other Times③⑥ 2 Hr.	“Malfunction” ④ 7 Days	Max Repair Time “Availability Loss” 8 Hr.
I	3 ⑦	30 Min.			
II	4	30 Min.	2 Hr.	7 Days	8 Hr.
III	6	4 Hr. ⑤	4 Hr. ⑤	14 Days	48 Hr.
IV	6	8 Hr. ⑤	8 Hr. ⑤	21 Days	3 Days
V	8	24 Hr. ⑤	24 Hr. ⑤	35 Days	21 Days

General Notes:

1. Units of time include non-working hours, weekends and holidays, unless specifically noted otherwise.
2. 1 day constitutes 24 hours, beginning at the time of occurrence or discovery.
3. Criticality Levels are defined in 5.1.6.

Notes:

- ① This number designates the number of malfunctions that will be equivalent to an availability loss (e.g., 8 malfunctions in a Criticality Level II system would be counted as 2 ea. available losses in determining incentive fee.)

ANNEX 5.5
AVAILABILITY
Table 5.5-2

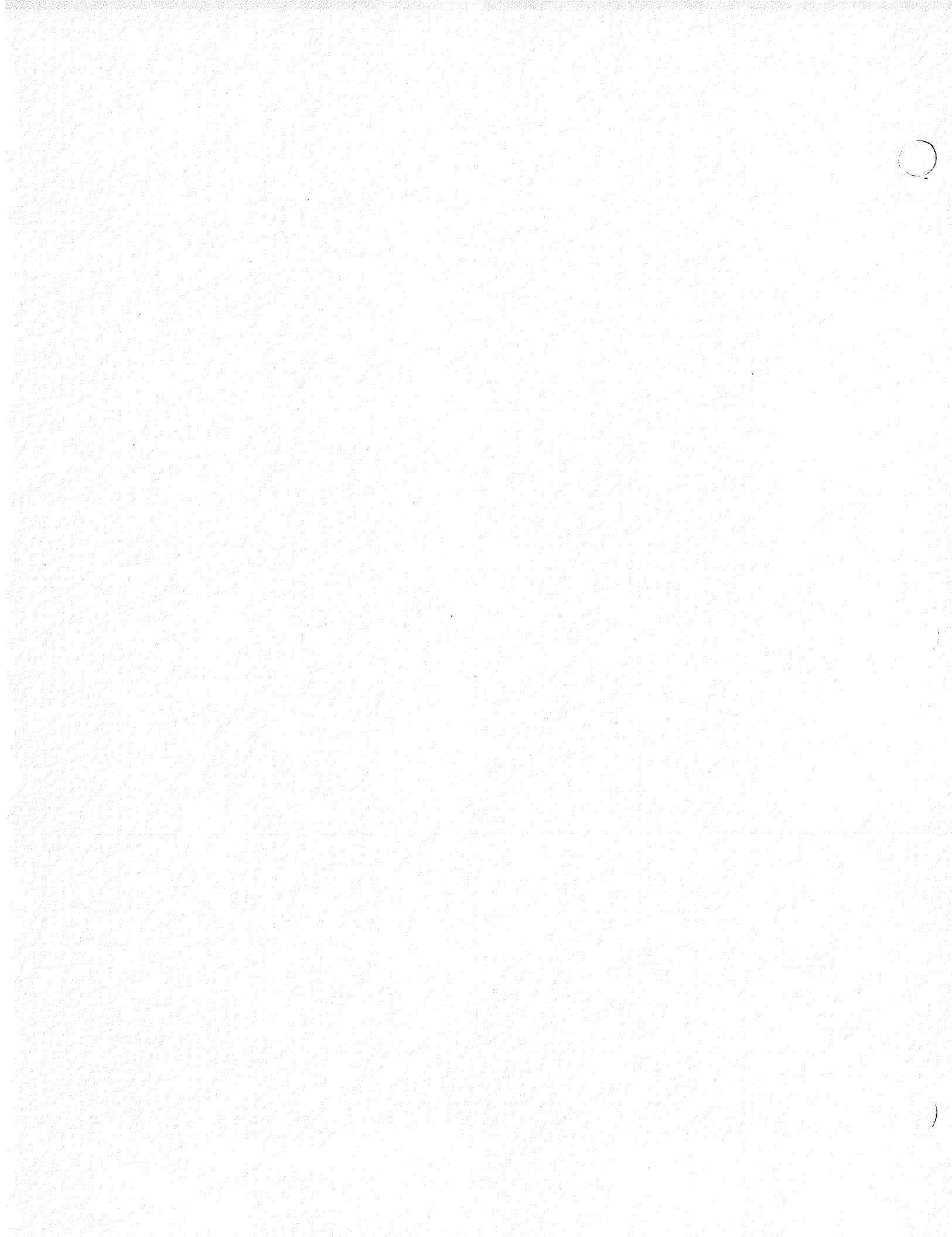
“Malfunction Conversion & Response/Repair Time Requirements”

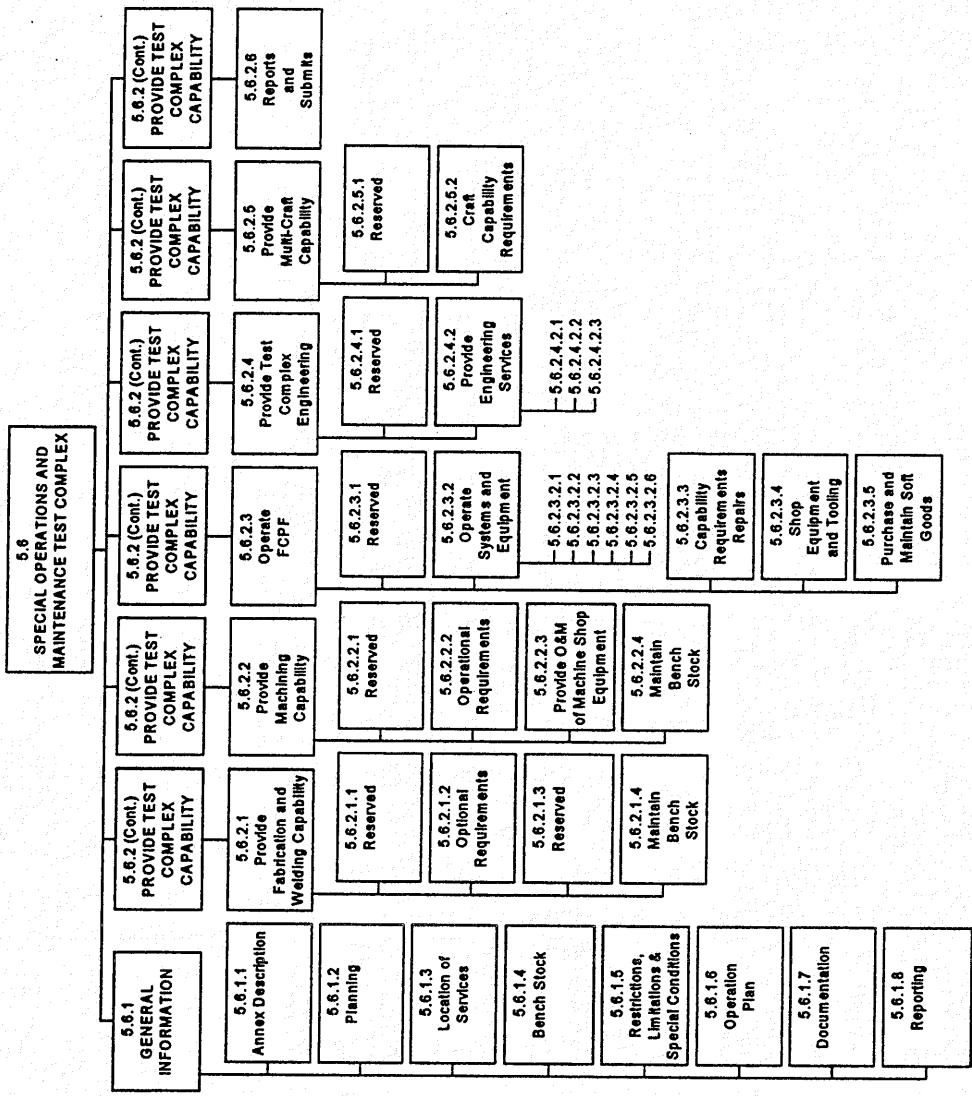
- ② Maximum response time when malfunction or availability loss occurs between 7 a.m. – 5 p.m., Monday through Friday, excepting Federal Holidays.
- ③ Maximum response time when malfunction or availability loss occurs on weekends, holidays or hours other than 7 a.m. – 5 p.m., Monday through Friday. Response is defined as arrival of skilled personnel at the job site to secure equipment, begin troubleshooting and initiate repairs.
- ④ Maximum time to complete repairs on fully redundant systems. These repair times also apply to all malfunctions.
- ⑤ Designated response time is measured in work hours, and excludes weekends, holidays and other non-working hours.
- ⑥ Response times for HVAC systems that do not have EMCS System 600-host visibility are increased by 4 hours.
- ⑦ For Sanitary Sewage Lagoons and Rock/Reed Systems, 5 malfunctions on a system are equivalent to an availability loss. A reportable excursion for which the State Department of Environmental Quality accepts the contractors explanation of causes, and for which the state issues no warnings, fines or other actions, is defined as a malfunction. If the state issues warnings, fines or takes other actions, the excursion is defined as Availability Loss.

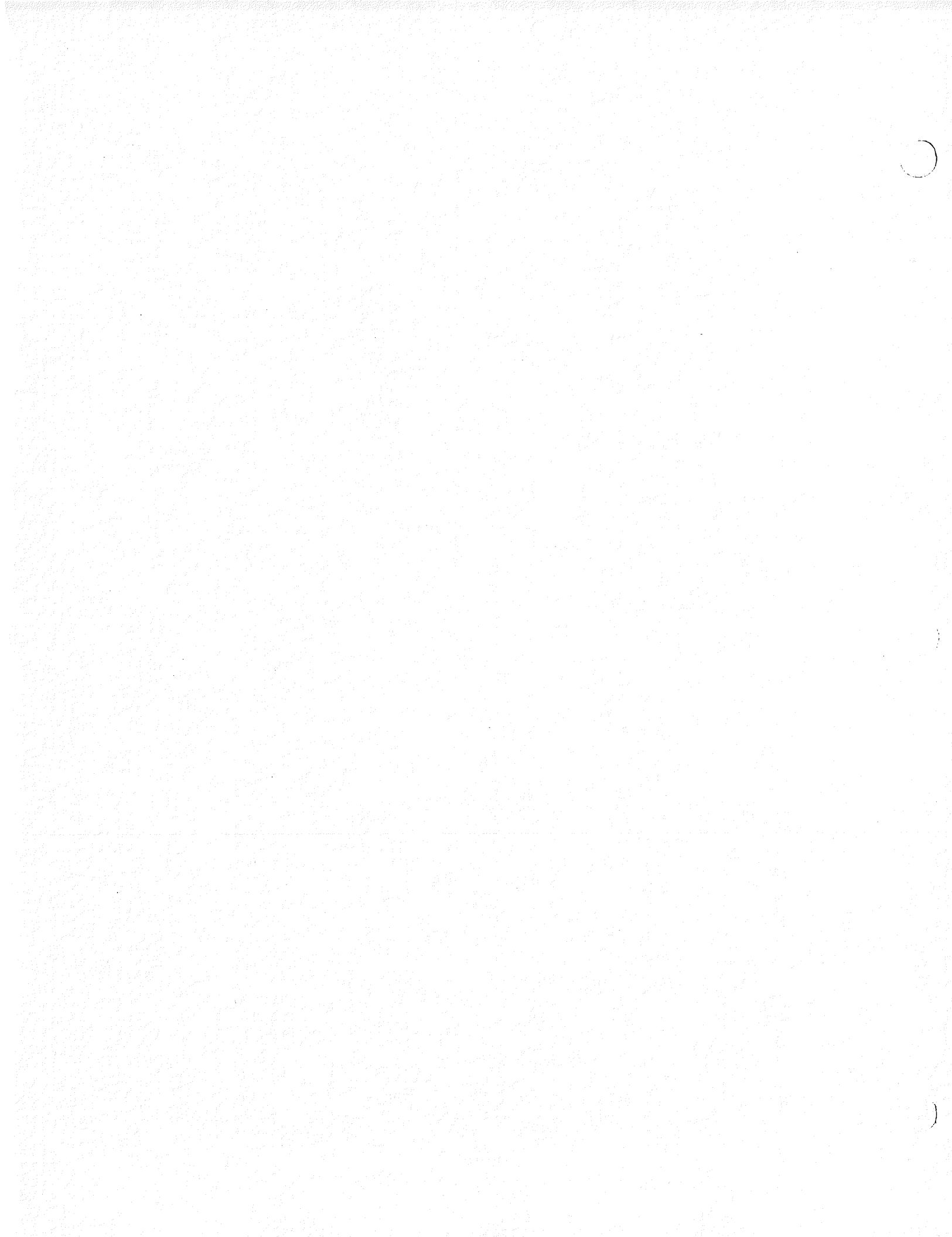
ANNEX 5.5
AVAILABILITY
Table 5.5-3

Criticality Level	Performance Incentive Fee (% of Total Incentive)											
	Quantity of Availability Losses											
	0	1	2	3	4	5	6	7	8	9	10	11
I	10%	5%	0	0*	0	0	0	0	0	0	0	0
II	35%	30%	20%	15%	10%	0	0*	0	0	0	0	0
III	30%	30%	25%	25%	15%	15%	10%	5%	0	0*	0	0
IV	20%	20%	20%	20%	15%	15%	10%	10%	5%	5%	0	0*
V	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	0	0*

* - The quantity of Availability Losses is considered unacceptable. Contractor shall develop & present a plan to correct deficiencies & reduce Availability Losses.







ANNEX 5.6 SPECIAL OPERATIONS AND MAINTENANCE TEST COMPLEX

5.6 OPERATIONS AND MAINTENANCE

5.6.1 General Information

5.6.1.1 Annex Description

This Annex defines the anticipated workload and special requirements for maintenance engineering, operations engineering and the implementation of required work for the Test Complex, Base, Resident Agencies and others. The Test Complex work is by definition in support of test programs and, as such, is critical to performing the mission of SSC as the Lead NASA Test Center for Rocket Propulsion. It is intended that sufficient work will be identified prior to the start of each fiscal year so that a core of dedicated engineers and craft persons will be available to perform test complex, base and resident agency work. This core level of work is identified in the Related Requirements and Information section of this annex and the FAMRP (See 5.1.2).

5.6.1.2 Planning

It is the intent of the Government that those maintenance activities that can be planned in advance (i.e. the design and implementation of the annual facility maintenance projects and design work for the Pressure Vessel Recertification Program) will have a work order issued prior to the start of each fiscal year. The Contractor shall work closely with the Contracting Officer to assure a clear understanding of the workload for each fiscal year.

5.6.1.3 Location of Services

The Contractor will be required to perform maintenance work throughout Stennis Space Center. The metes and bounds of SSC are defined in the SSC Master Plan. Delineation of test complex, institutional base and other areas are clearly defined in the Master Plan. (See 5.1.2)

5.6.1.4 Bench Stock

The Contractor shall be responsible to procure and maintain a level of bench stock to support the various kinds of work defined in this annex, such as machining, welding/fabrication and in the processing of fluid components (FCPF). The requirements for bench stock are defined in the Related Requirements and Information of each sub-annex of this annex. This bench stock is not to be confused with warehouse bench stock as specified in Annex 9.2. Bench stock is defined as material which will turn over at least 3 times per year, cannot be readily obtained through normal purchasing procedures in time to support a need for work requirements, is not carried as part of warehouse stock or there is a cost savings to the Government due to quantity discounts. Exception to the turnover rate can be made by the Government if the material cannot be obtained and certified for use within a turnover cycle (4 months).

5.6.1.5 Restrictions, Limitations & Special Conditions

Access control: The test complexes have strict procedures for daily access to perform work. Delays may be expected for access during testing or data operations. Digging in the test complexes is forbidden on test days without prior approval of the test stand managers. Obtaining permission for access from the test complex test stand engineers or manager is the responsibility of the Contractor. The Contractor is expected to be flexible to reassign workers to alternate work tasks when access is denied.

ANNEX 5.6

SPECIAL OPERATIONS AND MAINTENANCE TEST COMPLEX

5.6.1.6 Operation Plan (DR 5-GA15)

The Contractor will write and submit to the CO within 90 days of contract award an Operation's Plan. This Plan is to define how the Contractor will perform the work in this annex.

5.6.1.7 Documentation

All work shall be accomplished by approved work order. The contractor shall maintain job files for each work request. Documentation shall include: drawings or sketches, cost sheets, cost estimates, engineering calculations, bill of material, Certificate of Completion (COC), vendor data, parts books, work orders or other requirements documents, and other miscellaneous job information. This information shall be readily available to the Government.

5.6.1.8 Reporting

The Contractor shall submit the following reports to the Government (DR 5-GA20):

1. Daily, work schedule: This information will be integrated into the site wide **Master Schedule Data (See DR 5-GA19)**. It is maintained by others.
2. Monthly: Work Order Completion Report; Backlog Report; Summary Report by Cost Center; Cost of Maintenance by Program and split out into the eight maintenance categories defined by the **NASA Maintenance Manual NHB 8831.2A * * latest version. The Contractor shall be able to provide cost data for each facility (by facility number) and a lump sum cost for all facilities which do not have facility numbers.
3. Quarterly: Job Completion Report (Status of work orders completed during the fiscal year quarter and a summary of backlog of work)

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SPECIAL OPERATIONS AND MAINTENANCE TEST COMPLEX

<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARDS</u>
5.6.2	Provide Test Complex Capability	<p>The Contractor shall maintain work capability sufficient to support anticipated base-load work in the test complexes. The crews assigned to support test programs are to be experienced and have a corporate knowledge of the procedures, systems and the types of work in the test complexes. It is important that the crews be flexible to changes in work place and type of work due to daily flexing of test schedules. Daily coordination with test stand managers is mandatory to avoid conflicts with test schedules and other testing functions. Workload is a combination of very short turn-a-round repairs post test, repairs and fabrications in-situ between tests, internal repairs and modifications. Overtime demands for these crews can be high depending on customer requirements and the frequency of testing activities. It is normal practice to provide a repair crew within one hour of a breakdown or failure. These repair efforts can range from a few hours to two weeks or longer, and may involve an all out effort to complete the repair and get the test stands back into service.</p>	<p>Historical annual work effort for craftwork is as follows: base workload in test complex requires 15 manyears of welding, 6 manyears of carpenters/aborers and 3 manyears of expediting/tool crib effort. Historical peak workload is : 30 manyyears of welding/fabrication, 12 manyears of carpenters/aborers and 4 manyears of expediting/tool crib effort.</p>	<p>The Contractor shall be able to respond within one hour from notification and be able to provide 24 hours/day repair capability 7 days per week for a period not to exceed 3 weeks. The Contractor shall be able to set up a crew, be on the job site and be prepared to work continuously until the job is completed. The contractor shall complete all work within schedule. Rework shall not be an excusable delay.</p>

The workload for engineering is defined in 5.6.2.4.

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<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARDS</u>
5.6.2.1	Provide Fabrication and Welding Capability	<p>The contractor shall have or have access to the capability to perform shop and field fabrication for the: manufacture, repair and modification of on-site structures, piping, pressure vessels, equipment and other various fabrications and assembled items. Welding procedures must be developed (if not already available) to be able to weld complicated structures and welding of various steel alloys and other metals. The Contractor shall be able to provide capability to weld using: SMAW (stick welding), GTAW (gas tungsten arc), GMAW (gas metal arc) and use other techniques such as silver soldering, arc gouging and oxygen/acetylene cutting to achieve exceedingly high quality end results. Welding shall pass radiograph, dye penetrant, ultrasonic, acoustic and other inspection criteria equal to standards of the nuclear power industry. Welders must be certified in order to perform work on the particular work being accomplished. The work consists of fabricating and repairing piping, structures and components utilizing the latest welding and fabricating techniques. The materials used may be of various metals and other materials including, but not limited to: stainless steels, aluminum, carbon steel, cast iron, copper, bronze, alloys, Teflon, and non-metals. The Contractor shall be able to provide pressure vessels to</p> <p>**ASME Division I and Division II standards**</p> <p>and be ASME certified and stamped with a "U" code stamp for new pressure vessels and an "R" code stamp for repairs to pressure vessels. The work also includes extensive welding in field locations,</p>	<p>Minimum Workload: 100 work packages/year (average 385mh/work package including overtime) This equates to the minimum work load defined in the Related Requirements Section. The Contractor shall have the ability to augment the welders to achieve a work load of 150% of the minimum for a period of up to two weeks with a 7 day advance notice. This peak work load may occur up to 4 times in one year.</p> <p>Initial acceptance rate for welds shall exceed 90%.</p>	<p>Unless otherwise stated on the approved engineering packages, all fabrication and welding shall be accomplished in accordance with the **SSC, Engineering Standards, ASME Unfired Pressure Vessel Code, Division I and II, ANSI** or other industry standards. All welding shall be free from defects as determined by inspection procedures as defined in the standards and requirements documents.</p>

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<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARDS</u>		
		<p>including welding on and around flight hardware.</p> <p>The welding and fabrication work is normally performed from detailed engineering drawings, sketches or from a work order that requires the development of a shop work package.</p>				
		<p>Historical work data:</p> <p>The welding/fabrication personnel have historically been part of the multi-craft capability as defined in Item No. 5.6.2.5, with augmentation from the institutional base shop as required during periods of high work load.</p>				
		<p>Maximum work load can be as high as:</p> <table> <tr> <td>Craft Labor straight time = 60,000 mh/yr</td> </tr> <tr> <td>Craft Labor overtime = 8,000 mh/yr</td> </tr> </table>	Craft Labor straight time = 60,000 mh/yr	Craft Labor overtime = 8,000 mh/yr		<p>Overtime work is common for repair work with 60-hour weeks occurring approximately 10% of the time.</p> <p>Note: this workload is for the test complexes only. Institutional Base work is defined in Item No. 5.4</p>
Craft Labor straight time = 60,000 mh/yr						
Craft Labor overtime = 8,000 mh/yr						
5.6.2.1.1		Reserved		Contractor determined		
5.6.2.1.2		Operational Requirements		Contractor shall complete		

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SPECIAL OPERATIONS AND MAINTENANCE TEST COMPLEX

<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARDS</u>
		<p>capability to perform all requirements associated with: fabrication of shapes, repair of structures and components, and fabrication of new structures Special Test Equipment (STE) as defined by the requirements from test programs, base activities and resident agencies at SSC. The Contractor shall determine staffing levels, skill mix, and perform the training and certification required to accomplish work elements identified in this annex.</p> <p>Welding personnel certification requirements must provide assurance that the stringent requirements for precision and weld quality for test programs can be met. Work must pass rigid inspection criteria by methods such as dye-penetrant, ultrasound, hydrotest, pneumostatic, acoustic, radiographic and magnaflux inspections.</p> <p>The requirements for quick turn-a-round repairs and fabrication are common. The Contractor must have in place a work control process that can assess the prioritization between multiple customers and to communicate on a daily basis with the customer leads on statusing and scheduling changes.</p> <p>The contractor shall have capability to perform field repairs and fabrication of items. The requirements for repairs and fabrications are frequently determined by others, but the method to meet the requirements is the responsibility of the contractor.</p>		

Major equipment currently available and utilized to

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ANNEX 5.6
SPECIAL OPERATIONS AND MAINTENANCE TEST COMPLEX

<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARDS</u>
		perform fabrication and welding operations is listed in Table 5.6-1		
		Fabrication and Welding requirements include the preparation of detailed documents which list the steps required in the fabrication and repair activities. These documents (work plans) are required prior to working on any critical system.		
5.6.2.1.3	Reserved			
5.6.2.1.4	Maintain Bench Stock	The Contractor shall be required to procure and maintain bench stock at the existing value at start of contract. Replenishment shall be by approved work order or by specific funding line item. Bench stock is defined as: fabrication material such as pipe, plate, shapes, welding rod and wire and other materials which are not unique to any particular job effort but does not include operating supplies. It is intended that bench stock will be a zero cost against shop overhead, which means that any usage must be charged against the shop orders and then reordered to keep the dollar level of the bench stock at the agreed to level. Historically, bench stock value is approximately \$75,000.	Contractor Determined	Inventory level will be attained within 120 days after contract award. Dollar level of bench stock inventory shall be maintained plus or minus 20% from the inventory value. Inventory level shall not be more than 10% below the baseline value for more than 30 consecutive calendar days in any 6-month period. Inventory mix shall be continually adjusted to fit the current workflow through the shop.
5.6.2.2	Provide Machining Capability	The nature of the mission of SSC requires that many work packages	150 work packages	Complete all work plans on

ANNEX 5.6
SPECIAL OPERATIONS AND MAINTENANCE TEST COMPLEX

<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARDS</u>
		<p>parts and components are manufactured to special order or repaired as required. The Contractor shall have the capability to provide this service in a timely manner in accordance with customer requirements. The Contractor shall have the capability to provide precision machining support in materials such as stainless steel alloys, carbon steel, various alloys, other metals and non-metallic materials such as Teflon. The work is accomplished by approved work order and as a normal practice is produced from detailed drawings. Tolerances must meet or exceed the accuracy given in the SSC engineering standards **SSC Engineering Standard 66-505** or **SSC Engineering Standard 66-505* or drawings. The contractor shall also be able to produce machined components from sketches or from verbal instructions from the requestor. The Contractor shall produce cost estimates as requested on the work order. This service is normally utilized for quick turn-a-round requirements which cannot be obtained from outside vendors or manufacturers in a timely or cost effective manner.</p> <p>The historical work load for machining is 3 manyears/year. Peak workload is 6 manyears/year.</p>	<p>per year. Work packages average 34 mh each. The contractor shall be able to work at 150% of this work rate for a period not to exceed two weeks with 7 days advance notice. This rate may occur up to 4 times/yr.</p>	<p>schedule and in accordance with drawings or **SSC Engineering Standards** tolerances.</p>
5.6.2.2.1	Reserved			Contractor Determined
5.6.2.2.2	Operational Requirements			<p>The Contractor shall provide sufficient capability to be able to supply accurately machined parts used in the support of test programs, base activities, other on-site contractors and tenant agencies at SSC. Machining tolerance requirements are stringent for components used in test programs. Components must</p>

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ANNEX 5.6
SPECIAL OPERATIONS AND MAINTENANCE TEST COMPLEX

<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARDS</u>
		<p>be manufactured to strict design criteria and pass rigid inspection criteria. It is normal for the machine shop to work to detailed engineering drawings, but sketches or verbal concept requirements may be utilized as necessary and the machinists must be able to interpret sketches and verbal requirements definition and then to manufacture the items in accordance with **SSC Engineering Standards**.</p> <p>The requirements for quick turn-a-round repairs are common. The Contractor must have in place a work control organization that can assess the prioritization between multiple customers and to communicate on a daily basis with the customer leads on statusing and scheduling changes.</p> <p>The major portion of work requirements involve work in a machine shop environment; however, there may be minimal requirements for field work. (An example might be to reface a flange surface on a piping system in the field.)</p>	Nothing additional	<p>Machine shop equipment and tooling and the work area shall be maintained free of corrosion. Equipment shall be capable of machining to accuracies expected from this age of equipment.</p>
5.6.2.2.3	Provide operation and maintenance of machine shop equipment	<p>Maintain machine shop equipment and tooling. The list of major equipment is tabulated in Table 5.6-2.</p> <p>Should the Contractor elect not to utilize any piece or pieces of equipment, the Contractor shall provide a cost estimate to the Government to preserve the equipment in-situ such that the equipment will be preserved for a period of at least 5 years. The Contractor will assess and report on the operating condition of the equipment before it is taken out of service.</p>	Nothing additional	<p>Machine shop equipment and tooling and the work area shall be maintained free of corrosion. Equipment shall be capable of machining to accuracies expected from this age of equipment.</p>

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5.6.2.2.4	Maintain Bench Stock	<p>The Contractor is required to procure and maintain bench stock at the existing value at start of contract. Bench stock for machining work includes such items such as bar stock, shapes, plate, forgings and other items that fall under the category of bench stock as defined in 5.6.1.4.</p> <p>The Contractor shall manage the bench stock in accordance with Annex 9.2 of this Contract.</p>	Contractor determined	<p>Inventory level will be attained within 120 days after contract award. Dollar level of bench stock inventory shall be maintained plus or minus 20% from the inventory value. Inventory level shall not be more than 10% below the baseline value for more than 30 consecutive calendar days in any 6 month period. Inventory mix shall be continually adjusted to fit the current work flow through the shop.</p>
5.6.2.3	Operate Fluid Component Processing Facility (FCPF)	The Fluid Component Processing Facility currently located in Building 2205 provides extensive component inspection, repair, cleaning, and packaging capability in the shop and in the field. The Contractor shall staff, operate and maintain this facility in accordance with the sub-elements listed in this Annex.	16,000 tasks/yr. The average task is 2 mh for craft labor. Engineering services should be included in 5.6.2.4.2.	See Below
5.6.2.3.1	Reserved		Historic work load: 34,000 man-hours/year craft labor and 13,000 man-hours/year engineering services. See Table 5.6-3	C-5.6 Page 10
5.6.2.3.2	Operate Systems and Equipment	The Contractor is responsible for operator		Equipment and systems

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		maintenance of the installed and tagged equipment used by FCPF in performing work on components. Table 5.6-4 lists the significant equipment used by FCPF.		shall be operable.
5.6.2.3.2.1	Operate and Maintain Clean Line	The Contractor shall operate the clean line that uses chemicals to clean component parts. All materials and chemicals used to operate the clean line are to be charged to this annex. The Contractor will have an operating procedure that clearly defines safe operation of this system.		Chemicals shall be controlled such that cleaning levels can be obtained.
5.6.2.3.2.2	Operate and Maintain Clean Room	The clean room shall be operated by certified technicians and maintained to **Federal Standard 209E, Class 10,000** . The Contractor shall prepare an internal operating procedure to assure that this system will maintain cleanliness of cleaned components.		Cleanliness level shall be maintained. All components shall be cleaned and certified in accordance with requirements as defined in DR 6-RA01, **SSC Engineering Standards 79-001, 79-002, 79-010 and TP 0144**
5.6.2.3.2.3	Operate and Maintain Valve Testing Systems	The Contractor shall operate and maintain the pressure testing equipment for the certified pressure testing of relief valves and other components.		Equipment shall be in calibration and able to test to design level.
5.6.2.3.2.4	Operate and Maintain the Component Inspection Room	The Contractor shall operate and maintain an area utilized for the inspection, buy-off and packaging of cleaned components.		Area shall be orderly and components available for Government inspection.
5.6.2.3.2.5	Operate Installed and NASA Tagged	Operate and maintain the equipment listed in table C-5.6 Page 11		The Contractor shall be

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	Equipment	5.6.4 If the Contractor elects not to use any piece of equipment, the Contractor shall furnish the Government with a cost estimate to preserve the equipment for a period of 5 years.		responsible for inventorying and maintaining the equipment at a 90% availability factor.
5.6.2.3.2.6	Operate Tubing Manufacturing System	The Contractor will operate and maintain the tubing manufacturing system that is used to make flared tubing. The FCPF shall have the capability of manufacturing, bending and installing high pressure tubing (up to 15,000 psi working pressure) up to 2 inches in diameter.		The equipment will be capable of a 95% availability factor.
5.6.2.3.3	Capability Requirements: Repair Components and Other Devices on Demand	The FCPF will receive, inspect, provide ROM repair, test, clean, certify cleanliness, package and ship components/assemblies/ subassemblies and document all inspection, testing and repairs in accordance with SSC engineering standards. In addition to shop work, the FCPF crew will provide field labor to test, and/or remove components to the shop for testing and repair and reinstall the components in the field.	Contractor Determined	All work packages will be scheduled, prioritized in accordance with customer need date and completed within the schedule. Work shall meet or exceed standards, specifications or other requirements.
5.6.2.3.4	Shop Equipment and Tooling	See Table 5.6-4		Inventory level will be attained within 120 days after contract award. Dollar level of bench stock inventory shall be maintained plus or minus 20% from the inventory value. Inventory level shall not be more than 10%
5.6.2.3.5	Purchase and Maintain Soft Goods and Other Bench Stock	The Contractor shall be required to procure and maintain bench stock at the existing value at the start of the contract. Replenishment shall be by approved work order or by specific funding line item. Bench stock is defined as: lox compatible soft goods, miscellaneous soft goods, component repair kits, teflon, bags, tape, grease, miscellaneous bolts, washers and nuts, miscellaneous tubing fittings, and miscellaneous cleaning supplies which are not unique		C-5.6

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5.6.2.4	Provide Test Complex Engineering	<p>to any particular job effort but does not include operating supplies. It is intended that bench stock will be a zero cost against shop overhead, which means that any usage must be charged against the shop orders and then reordered to keep the dollar level of the bench stock at the agreed to level. Historically, bench stock value is about \$300,000.00.</p> <p>There are special requirements for engineering work for test programs and for test complex facility maintenance. These requirements are divided into three areas: Component Engineering, Area Engineering and Field engineering. The special requirements for each of these requirements are listed in the sub-annexes below.</p> <p>Historical Work Load Data:</p>	See Below	<p>below the baseline value for more than 30 consecutive calendar days in any 6 month period. Inventory mix shall be continually adjusted to fit the current work flow through the shop.</p>
5.6.2.4.1	Reserved			
5.6.2.4.2	Provide Engineering Services		See below	
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5.6.2.4.2.1	Provide Component Engineering Capability	<p>The requirements are:</p> <ol style="list-style-type: none"> 1. Maintain, update and write specifications for components. These standards are called **Standardized Control Drawings (SCD's or commonly called B00-Specs.)**. The responsibility for selection of components for the correct application and maintenance of all component site standards and procurement specifications falls within this organization. 2. This includes engineering in the FCPF and, as such, makes all engineering decisions regarding repair techniques, application of components and piece parts, and disposition of Discrepancy and Corrective Action reports for components. Close interface with shop and quality personnel is required along with good customer relations. 3. This function coordinates the procurement of spare parts for various programs and base side. As part of this effort, maintain a data base on all backlog of spares requirements, canvas customers annually on their requirements for the next year, and provide a prioritized listing of requirements for spares prior to the start of each fiscal year. The requirements for spares shall be segregated by program. Synergy and commonality between programs shall be cost reduction emphasis. This function shall serve as the advocate for spares procurement and coordinate all annual requirements with the various NASA Program Offices and Construction Group. Construction and maintenance activities shall develop spare 	400 tasks/yr for SCD's 200 tasks/yr in FCPF 1 annual task for spares requirements document	SCD's will be current and changes will be input within 3 months of requirement. Engineering decisions will be completed within 1 day for shop work. Customer coordination will be timely and technically in accordance with SSC standards.

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		<p>parts lists which are divided into: large dollar spares, operating spares and consumable startup items.</p> <p>4. This function coordinates spares procurements to meet customer need dates, maintain a data base on the status of each item and provides the customer with weekly or monthly updates in delivery information. (Depending on the criticality of the customer requirements, this update procedure may be required daily but no less often than monthly.)</p> <p>5. Review shop bench stock and assure that quantities and type of material are adequate to meet customer needs.</p> <p>6. Provide cost estimates for repairs.</p>	<p>Designs: 40/year Write Shop Packages: 150/year Studies, & engineering evaluations: 50/yr Work Coordination: 130/yr Status Meetings: 52/yr Reports: 12/month Quick response/problem solving: 25/yr Pressure Vessel initial certifications: 15/yr. Recertifications: 10/yr. Periodic inspections of</p>	
	5.6.2.4.2.2	Provide Area Engineering Capability	<p>The following functions are performed: Provide design engineering and drafting for the Pressure Vessel Recertification Program; Plan and coordinate all facility maintenance projects; Provide support to field engineering for maintenance and construction projects; Provide coordination and corporate knowledge for all test complex facilities maintenance; Provide drafting support for design packages, and construction drawings; and coordinate the Annual Facilities Maintenance Inspection, maintain the Backlog of Maintenance Inspection (BMAR) databases and develop the maintenance five-year plan.</p>	<p>C-5.6 Page 15</p>

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5.6.2.4.2.3	Provide Field Engineering Services	<p>The Field Engineering function is responsible for managing, planning and implementing craft type work in the test complexes. These functions are critical functions and require extensive maintenance and construction experience on high pressure gas, liquid and cryogenic systems. The field engineers are responsible for assuring that work is accomplished in accordance with the work packages or designs and that the end product of the work meets or exceeds the requirements.</p> <p>Required personnel qualifications shall be compatible with Annex 3.</p>	<p>380 tasks/year CADD: 300/yr.</p>	<p>Complete all tasks within schedule and cost.</p>
5.6.2.5	Provide multi-craft capability	<p>Craft capability is required to implement repair and construction projects and to perform normal maintenance activities in the Test Complexes. The work is normally quick turn-on and completion in nature. The expediting, field warehouse, tool crib, and bench stock and storage yard. All of these activities are for quick response capability and to manage and implement the basic workload within the test complexes.</p>	<p>380 tasks/year plus 150 tasks/year for minor maintenance trouble calls.</p>	<p>All tasks shall be completed within the scheduled completion date and the quality of work shall be in accordance with specifications and site wide standards.</p>

Historic work load: 6 manyears of carpenters/laborers, 5 electricians, 1 tool crib person, 1-1/2 expeditor/runner, 3 painters (This is the minimum work load; historic average work load exceeds this by C-5.6

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		a factor of 2 for the hands-on craftsmen.)		
		In addition to the personnel in the test complex, support is required for rapid response from the base shops. For example, support is required from: heavy equipment, carpentry, high voltage electrical, mechanical plumbing, roads and grounds, and other various shops.		
5.6.2.5.1	Reserved	Craft persons must be highly skilled in their respective trades and be trained and certified to operate equipment and perform work to detailed specifications, work plans and blueprints. Workers assigned to the test complex must be knowledgeable of the access control procedures.	See Annex 5.7	See Annex 5.7
5.6.2.5.2	Craft Capability Requirements	Craft persons must be highly skilled in their respective trades and be trained and certified to operate equipment and perform work to detailed specifications, work plans and blueprints. Workers assigned to the test complex must be knowledgeable of the access control procedures.	See Annex 5.7	See Annex 5.7
5.6.2.6	Reports and Submits	5 year maintenance plan for test complexes Annual facility inspection data sheets Backlog of Maintenance (BMAR)-update 4 times/yr Annual facility maintenance project list Project Status List (monthly)		

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TABLE 5.6-1
FABRICATING SHOP EQUIPMENT

Type of Equipment	Equipment Number	Description	Capacity
BREAK	590010	PLATE BENDER	1/4" X 12"
SHEAR	1010738	METAL SHEAR	3/4" X 12"
ROLL	589987	METAL ROLL	1/2" X 6"
ROLL	1910806	METAL ROLL	1/2" X 12"
BREAK	8191136	METAL BREAK, MANUAL	1/8" X 6"
BREAK	1910807	METAL BREAK, MANUAL	1/8" X 6"
CHOP SAW	1010715	METAL CUTTING SHOP SAW	
PUNCH	590004	METAL PUNCH AND ANGLE CUTTER	2" HOLES/6" ANGLES
PIPE BENDER	590026	PIPE BENDER	3"
SHEET ROLL	1542237	SMALL SHEET METAL ROLL	4"
SHEAR	753403	Sheet Metal Shear	1/4"
CIRCLE CUTTER	590400	CIRCLE CUTTER	UP TO 36"
GRINDER	590357	METAL GRINDER	
BELT SANDER		BELT SANDER	10"
DRILL PRESS	819131	DRILL PRESS	
BAND SAW	133468	BAND SAW	20"
PIPE NIPPER	1323372	WELD PREPARE PIPE	2"

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CUTOFF SAW	132666	MANUAL CUTOFF SAW	24"
ROLL	1012131	METAL ROLL	1"
PRESS	1011234	HYDRAULIC PRESS	36" X 100 TON
FORKLIFT	120-129	FORK LIFT	6,000#
FORKLIFT	120-147	FORK LIFT	1,200#
CUTTER	397088	PAK 45 METAL CUTTER	3"
WATER CUTTER	G32886	ESAB PLASMA CUTTER	3" THICK
WELDER	G034298	WELDER-LINCOLN 250D	STICKWELD, GTAW, TIG
WELDER	G034341	WELDER-LINCOLN 500	GTAW
WELDER	G034448	WELDER-LINCOLN 300	SMAW, GTAW
WELDER	G034449	WELDER-LINCOLN 300	SMAW, GTAW
WELDER	G0304450	WELDER-LINCOLN 300	SMAW, GTAW
WELDER	396294	WELDER-MILLER TRAILBLAZER 44E	GTAW, SMAW
WELDER	396295	WELDER-MILLER TRAILBLAZER 44E	GTAW, SMAW
WELDER	1224852	WELDER-MILLER TRAILBLAZER 44D	GTAW, SMAW
WELDER	1224853	WELDER-MILLER TRAILBLAZER 440	GTAW, SMAW
WELDER	1540798	WELDER-MILLER TRAILBLAZER 440	GTAW, SMAW
WELDER	1324019	WELDER-MILLER TRAILBLAZER 440	GTAW, SMAW
WELDER	1541600	WELDER-MILLER	GTAW, SMAW

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WELDER	1541601	TRAILBLAZER 440	WELDER-MILLER TRAILBLAZER 440	GTAW, SMAW
WELDER	1542052		WELDER-LINCOLN E. 36132 TIG 255	GTAW
WELDER	1542053		WELDER-LINCOLN E. 36132 TIG 255	GTAW
WELDER	590420		WELDER-LINCOLN E. 63672	SMAW, GTAW
WELDER	819153		WELDER-MILLER AIRCRAFTER 330ST	SMAW, GTAW
WELDER	819154		WELDER-MILLER E. PAC 111	STICK AND GTAW
The following tools and equipment are located at Building 4301:				
POWER SUPPLY	H033022		POWER SUPPLY	
FORK LIFT	H033512		FORK LIFT	
CUT-OFF SAW	H034332		CUT OFF SAW	
DRILL	14580		DYMO DRILL	
MAN LIFT	144843		GENIE LIFT	
POWER SUPPLY	145037		WELDING POWER SUPPLY	
POWER SUPPLY	145037		WELDING POWER SUPPLY	
POWER SUPPLY	145039		WELDING POWER SUPPLY	
WELDING MACHINE	145042		WELDING MACHINE	
WELDING MACHINE	145043		WELDING MACHINE	

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WELDING MACHINE	396993	WELDING MACHINE
WELDING MACHINE	752427	WELDING MACHINE
WELDING MACHINE	752466	WELDING MACHINE
TABLE SAW	752727	TABLE SAW
DRILL PRESS	752868	DRILL PRESS
SAW	753286	RADIAL ARM SAW
WELDING MACHINE	819151	WELDING MACHINE
DRILL	1223611	DRILL PRESS
MAN LIFT	1223677	80 FOOT MAN LIFT
WELDING MACHINE	1224231	WELDING MACHINE
BENDER	132884	ELECTRIC BENDER
TORCH	1323951	PLASMA ARC TORCH
THREADING MACHINE	1324634	THREADING MACHINE
PRESSURE WASHER	1324637	PRESSURE WASHER
PRESSURE WASHER	13246638	PRESSURE WASHER
WELDING MACHINE	1539612	WELDING MACHINE
WELDING MACHINE	1539643	WELDING MACHINE
WELDING MACHINE	1539644	WELDING MACHINE
WELDING MACHINE	1539645	WELDING MACHINE
WELDING MACHINE	1539646	WELDING MACHINE
BENDER	1539669	CONDUIT BENDER
SPIDER	1540018	CLIMBING SPIDER
WELDING MACHINE	1540906	WELDING MACHINE
WELDING MACHINE	15411213	WELDING MACHINE
HYDRAULIC PRESS	1541254	HYDRAULIC PRESS

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BAND SAW	1911499	BAND SAW	
DRILL SHARPENER	15414554	DRILL SHARPENER	

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TABLE 5.6-2
MACHINE SHOP TOOLING

NAME	EQUIPMENT NUMBER	DESCRIPTION	CAPACITY
VERT. MILL	591451	VERTICAL MILL	120 INCHES
VERT. MILL	594305	VERTICAL MILL	62 INCHES
DRILL PRESS	1323235	RADIAL ARM DRILL PRESS	5 FEET
LATHE	G32881	CLAUSING 15" LATHE	15" X 4'
LATHE	398291	CLAUSING 15" LATHE	15" X 4'
LATHE	594325	MONARCH LATHE	40" X 6'
LATHE	1541419	MONARCH LATHE	20" X 36"
LATHE	594319	MONARCH LATHE	30" X 48"
LATHE	594342	MONARCH LATHE	16-1/2" X 54"
LATHE	594341	AMERICAL PALL MAKER	16 X 30
LATHE	1011932	COLECHESTER	21" X 6'
LATHE	594328	MONARCH LATHE	12-1/2" X 20
GRINDER		PEDISTAL GRINDER	6"
GRINDER	591444	PEDISTAL GRINDER	6"
DRILL PRESS	591361	DRILL PRESS	3" X 18" STROKE
PRESS	594313	BENCH TOP PRESS	1" X 4"
LATHE	594338	JEWEL LATHE	
PRESS DRILL	594333	CHEERMAN JIG BORE	16" X 36"
PRESS DRILL	818996	RONGFU	8" X 24"
OPTICAL COMP.	818995	STARRET OPTICAL	

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		COMPARTOR	
LATHE	594329	MONARCH LATHE	12-1/2" X 20"
LATHE	1225132	VICTOR LATHE	11" X 16"
ENGRAVER	1322751	VANGUARD	11" X 19"
PRESS	1539479	HYDRAULIC PRESS	55 TONS
GRINDER	591353	DRILL BIT GRINDER	#30 - 3/4"
GRINDER	591352	CARBIDE TOOL GRINDER	14"
MILL	1172896	UNIVERSAL KEARNEY TUECKER MILL	24" X 40"
GRINDER	5941625	SURFACE GRINDER	16" X 40"
GRINDER	591355	CINCINNATI TOOL GRINDER	
GRINDER	591358	END MILL GRINDER	
GRINDER	1010702	LARGE TOOL BIT GRINDER	3/4" X 3"
MILL, INDEX	591448	INDEX MILLING MACHINE	18" X 30"
MILL	125415	BRIDGEPORT MILLING MACHINE	18" X 30"
MILL	591343	BRIDGEPORT MILLING MACHINE	18" X 30"
MILL	591364	SMALL HORIZONTAL MILL MACHINE	6" X 16"
MILL	1541418	KEARNEY & TRECKER MILL	24" X 48"
MILL	G33900	C & C HERCO UNIVERSAL MILL	27" X 54"
METAL SAW	591394	DO ALL BAND SAW	32"

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MILL	133049	C & C HURCO KNEE MILL	17" X 27"
SAW, CUT OFF	819145	MARVEL CUT OFF SAW	16"
HORIZ. BORE MILL	591347	G & L	74" X 48"
HORIZ. BORE MILL	594382	LUCAS HORIZONTAL BORING MILL	60" X 40"
OVEN, HEAT TREAT	1172845	THERMCRAFT HEAT TREATING OVEN 2500 °F	24" X 18" C 40"
GRINDER	591348	PEDESTAL GRINDER	12"
TOOLING, INCLUDING: BITS, TOOLING, END MILLS, REAMERS, TAPS, DIES, CARBIDE INSERTS, CUTTING BLADES, SAWS, ETC. APPROXIMATE VALUE IN FY97 DOLLARS = \$100,000.00 (OR GREATER)			

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TABLE 5.6.-3
COMPONENTS PROCESSED FY98

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MISC.	24,833
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Notes:

- Flex hoxes ranged in diameter form 0.25" to 2" with an average length of 12' (equivalent of 876 feet for FY97)
- Pipe ranged in diameter from 1.5" to 12' with an average length of 10' (equivalent to 300 feet in FY97)
- Tubing ranged in diameter from 0.25" to 2" with an average length of 6' (equivalent to 9,786 feet for FY97)

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TABLE 5.6-4
FCPF EQUIPMENT

<u>ECN</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Use</u>	<u>Cost</u>
G032554	Sealing Machine	Emplex	Protective bag sealing	\$2,225
G032555	Sealing Machine	Emplex	Protective bag sealing	\$2,225
G033760	Data Plate Marker	Dayton Electric	Component ID tag manufacture	\$8,755
G033834	Impact Wrench	Ingersol-Rand	Misc. component rework	\$1,450
0014989	Bench Oven	Dayton Electric	Parts Drying	\$1,999
0014991	Flow Bench	Laminar Flow	Clean Room Support	\$4,754
0015726	Fork Lift Truck	Caterpillar	Misc. Component Lifting	\$16,613
0015735	Solvent Recovery Still	Corpane	Freon Recovery	\$14,549
0016186	Strip Chart Recorder	Gulton Ind.	Clean Room Support	\$1,000
0016187	Laser Particle Recorder	TSI Inc.	Clean Room Support	\$2,290
0016188	Laser Particle Recorder	TSI Inc.	Clean Room Support	\$2,290
0016189	Laser Particle Recorder	TSI Inc.	Clean Room Support	\$2,290
0016190	Laser Particle Recorder	TSI Inc.	Clean Room Support	\$2,290
0016191	Remote Processor	TSI Inc.	Clean Room Support	\$1,900
0016194	Remote Processor	TSI Inc.	Clean Room Support	\$1,900

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TABLE 5.6-4
FCPF EQUIPMENT

0034316	Ph Meter	Omega Eng. Inc.	Chem/Solvent sampling	\$2,277
0034317	Ph Meter	Omega Eng. Inc.	Chem/Solvent sampling	\$2,277
0034318	Ph Meter	Omega Eng. Inc.	Chem/Solvent sampling	\$2,277
0034434	Electronic Balance	Denver Inst.	Chem/Solvent sampling	\$1,097
0036771	Hydraulic Torque Wrench	Florida Pneumatic	Misc. component rework	\$2,469
0036976	Fluid Pump	Haskel Inc.	Water/Freon transport w/in shop	\$1,225
0036977	Fluid Pump	Haskel Inc.	Water/Freon transport w/in shop	\$1,225
0036979	Gas Booster Pump	Haskel Inc.	Test cell support	\$3,795
0036981	Gas Booster Pump	Haskel Inc.	Test cell support	\$3,795
0133681	Sealing Machine	Vertrod Corp	Protective bag sealing	\$6,075
0289633	Flaring Machine	Conrac corp.	Tubing manufacture	\$14,275
0397214	Air flow oven	WWR Scientific	Component drying	\$4,250
0590326	Hydrostatic Test Stand	Crane Risotoflex	Hydro pressure test	\$15,819
0590328	Swaging Machine	Crane Risotoflex	Tubing manufacture	\$11,792
0590331	DriveUnit	Allenaircorp.	Flex hose manufacture	\$2,600
0590332	Swager	Allenaircorp.	Tubing manufacture	\$1,395
0590338	Solvent Reclamation unit	Copane Ind.	Freon Recovery	\$9,950

ANNEX 5.6
SPECIAL OPERATIONS AND MAINTENANCE TEST COMPLEX

TABLE 5.6-4
FCPF EQUIPMENT

0590341	Sealing machine	Vertrod Corp	Protective bag sealing	\$1,275
0590349	Hoist	ARO Corp.	Misc. component lifting	\$1,879
0590431	Utility Truck	Textron	Misc. transportation	\$2,590
				\$920
0590457	Hydraulic Press	Dake	Component rework 50 ton	
0753659	Mass Spectrometer	Varian Assoc.	Vacuum leak checks	\$13,560
0753704	Parts Dryer	Randall Mfg.	Sample bottle cleaning	\$2,313
0753705	Parts Washer	Randall Mfg.	Sample bottle cleaning	\$9,905
0753706	Parts Rinser	Randall Mfg.	Sample bottle cleaning	\$3,096
	Microscope	Cambridge Inst.	Clean room support	\$2,758
	Tube End Finishing Machine	Phi/Conrac	Tubing manufacture	\$6,985
	Pedestal Buffing Machine	Baldor	Misc. component rework	\$11,323
	Engine Lathe	Emco Maier Corp.	Misc. component rework	\$1,311
	Utility Truck	Textron Corp	Misc. transportation	\$3,500
	Drilling Machine	Wilton Corp.	Misc. component rework	\$1,708
	Horizontal Flow Console	Laminar Flow Inc.	Clean room support	\$2,610
	Gas Booster Pump	Haskel Inc.	Test cell support	\$4,332
	Gas Booster Pump	Haskel Inc.	Test cell support	\$4,332

ANNEX 5.6
SPECIAL OPERATIONS AND MAINTENANCE TEST COMPLEX

TABLE 5.6-4
FCPF EQUIPMENT

Portable Power Pack	Hytork	Misc. component rework	\$3,711
Bench Micrometer	Starrett	Misc. component rework	\$1,311
Data PlateMarker	Defiance Machine	Component ID marking	\$8,740
Relief Valve Tester	Duns valve	Relief valve testing	\$56,435
Chain Hoist	Columbus	Misc. component lifting	\$1,425
Tube Bender	Parker-Hannifin	Tubing Manufacture	\$2,444
Chain Hoist	Columbus	Misc. component lifting	\$3,394
Pressure Washer	Landa Mfg.	Field Cleaning	\$3,394
Parts Washer	ADF Systems	Aqueous component cleaning	\$19,895
Crimp Machine	Aeroquip Corp.	Flex hose manufacture	\$3,175
Torque Calibrator	Snap-on Tools	FCPF torque tool support	\$1,100
Ultrasonic Liquid Processor	Misonix Inc.	Misc. component cleaning	\$3,826
Wet Cut Saw	Keller Machine	Tubing cutting	\$3,665
Moisture Analyzer	Meeco	Tubing/Flex hose support	\$7,920
Moisture Analyzer	Meeco	Tubing/Flex hose support	\$7,920
Original Purchase Cost of Equipment Listed --			
			\$358,186

ANNEX 5.6
SPECIAL OPERATIONS AND MAINTENANCE TEST COMPLEX

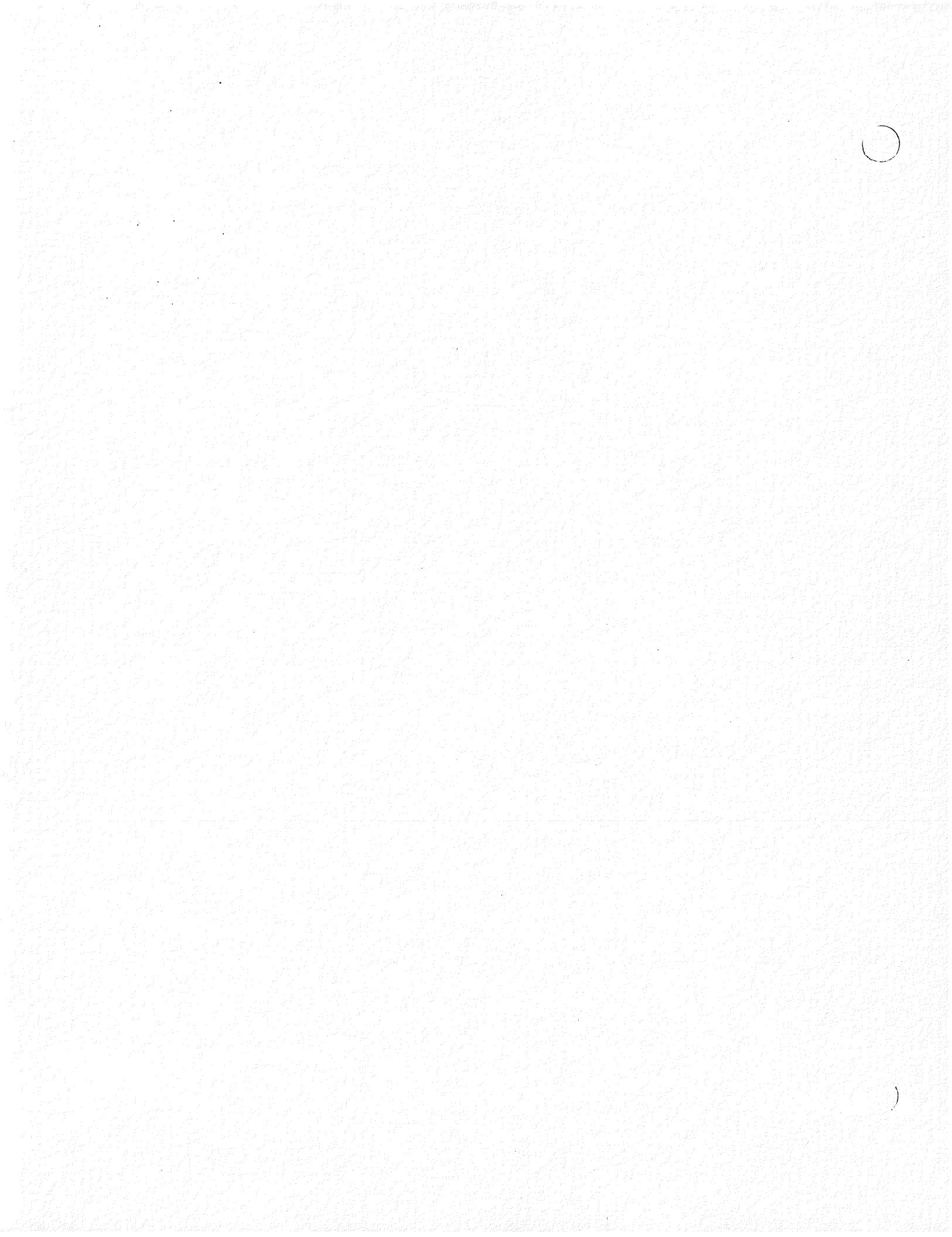
TABLE 5.6-4 FCPF EQUIPMENT	
	Note: This list of equipment represents only those items considered "significant".

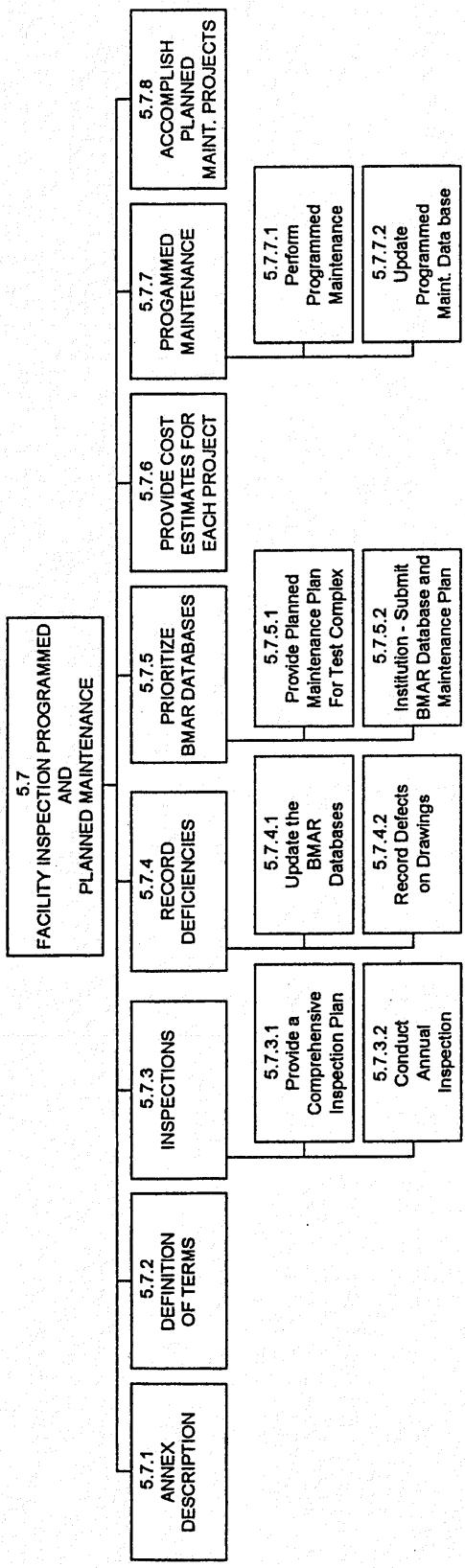
ANNEX 5.6
SPECIAL OPERATIONS AND MAINTENANCE TEST COMPLEX

TABLE 5.6-5
FCPF BENCHSTOCK VALUE

Note: The values for the various benchstock materials are for historical value only and should not be considered specific to the requirements for each type of benchstock at the time of contract award.

Item	Estimated Value
Lox compatible softgoods (certified lox compatible)	\$150,000
Miscellaneous softgoods	\$30,000
Component repair kits	\$25,000
Teflon bags, tape, grease	\$8,500
Miscellaneous nuts, bolts, washers	\$7,500
Miscellaneous fittings	\$6,500
Miscellaneous cleaning supplies	\$110,000
Total Benchstock Estimate	\$337,000





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ANNEX 5.7
FACILITY INSPECTIONS PROGRAMMED AND PLANNED MAINTENANCE

5.7.1 Annex Description

This Annex identifies the requirements for the annual visual inspection of the structures, facilities, utilities, systems and subsystems (SFUSS) at Stennis Space Center (See 5.1.2) to meet the intent of **NHB 8831.2A**. The results of the inspection are compiled and summarized in the Backlog of Maintenance and Repair (BMAR) databases. The BMAR databases shall also contain all equipment and facility systems that are no longer economical to repair or are within 5 years of expected service life. There are two databases, one for facilities and equipment within the Test Complex and the second for institutional facilities and equipment. The BMAR database shall then be used as a basis for the Annual work plans, from which the planned maintenance projects are funded.

This Annex also identifies specific maintenance that occurs on a recurring cycle of one or more years.

5.7.2 Definition of Terms

- a. **Backlog of Maintenance and Repair (BMAR):** The unfunded facilities maintenance work required to bring facilities and collateral equipment to a condition that meets acceptable facilities maintenance standards.
- b. **Collateral Equipment:** See definitions in Annex 5.1.
- c. **Common Use Areas:** Facilities and/or portions of facilities, to which access is afforded and which are constructed, maintained and operated specifically for, but not incidental to, the benefit of all SSC residents. Common use areas include entry and hallways, stairs and stairwells, restrooms, and vending areas within dedicated facilities. Access restrictions, for security or other reasons, does not alter this definition.

- d. **Equipment:** For purposes of this annex equipment is defined to mean collateral equipment.
- e. **Facilities:** A facility is an enclosed structure to protect personnel, material or equipment from the elements and provide associated work or storage space. For purposes of this contract, a facility includes the utility systems inside the building/structure and extends five feet from the facility or as otherwise defined.
 - (1) **Architectural.** Includes (interior/exterior): doors; windows; flooring (coatings and coverings); stairs and stairwells; interior walls, ceilings, and partitions
 - (2) **Structural.** Includes foundation; structural system; building shell; roof; external attachments (e.g. walkway covers, overhangs, loading docks, etc.); and facilities water collection and drainage system.
 - (3) **Electrical.** Includes: electrical wiring and lighting, hardware, and panels; power for equipment up to the point of disconnect, grounding or lightning arresting systems; alarm systems and communication equipment (excluding telephones).
 - (4) **Mechanical.** Includes all equipment, components and controls associated with the following systems as well as components located outside the facility: HVAC; plumbing; compressed air; steam; fire suppression; gas; boilers, furnaces; and generators.

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ANNEX 5.7
FACILITY INSPECTIONS PROGRAMMED AND PLANNED MAINTENANCE

- (5) **Building Specialty.** Includes: installed equipment within the facility such as food service and processing equipment; appliances; elevators; automatic doors; roll-up doors; blast doors; vehicle gates; waste disposal equipment; shop equipment and hoists.
- f. **Institution or base:** For purposes of this contract Institution and Base are used interchangeably. Institution refers to those facilities and equipment that are in the fee area, west of a line parallel to and 1000 feet west of D road and excludes all Test Complex structures, facilities and utilities, and the Army Complex.
- g. **Planned Maintenance Projects:** A project which is approved and funded for a fiscal year as a result of the comprehensive inspection process (5.7.3.2 - 5.7.8) or as designated by the CO.
- h. **Structures:** A structure is a constructed unit established for a designated objective. Structures that are part of or inside a facility are included with the facility. For purposes of this contract, structures are generally described as:
- (1) Allowing pedestrian and vehicular transportation. Includes roads and parking areas, paved or gravel surfaces, curbs, shoulders, guard rails, medians, wheel stops, walkways, bridges, sidewalks, and associated hardware.
 - (2) Preventing access and maintaining privacy. Includes fences, gates, barbed wire, grounding systems, planters, bollards, chains, and associated hardware and attachments.
- (3) Retaining or directing natural elements. Includes culverts, drainage systems, gravity storm water systems, retaining wall, bulkheads, landscaped borders, head walls, rip rapped areas, retention/detention ponds, spillways, canals, navigational lock, catch basins, and oil/water separators.
- (4) Providing information. Includes signs, pavement markings, flag poles, displays, historical markers, monuments and associated equipment.
- (5) Other. Boat ramps, docks, landfill, and associated equipment.
- i. **Test Complexes:** For the purpose of this contract, all facilities, equipment and land east of a line parallel to and nominally 1000 feet west of D road and extended to the ARMY complex.
- j. **Utility Systems:** A utility is a system for collecting or distributing services between a common point and specific locations both above and below ground. See Annex 5.1, Table 5.1-1 for descriptions of utility systems.
- 5.7.3 Inspections**
Limitations and Restrictions
- Inspection of interior architectural systems in a facility is restricted to common use areas in Resident Agency occupied buildings.

ANNEX 5.7
FACILITY INSPECTION PROGRAMMED AND PLANNED MAINTENANCE

<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARD</u>
5.7.3.1	DR 5-FA03 Develop a comprehensive inspection plan and schedule. Update the schedule annually and whenever changes occur. DR 5-FA03 Provide a separate schedule for the Test Complex and the base.	The Contractor shall develop an inspection plan and schedule for all SFUSS. The plan shall include inspection criteria, in the form of checklists, specific to the system being inspected.	1 Plan 2 schedules – one for the Test complex and one for the Institution.	Provide the plan and schedules to the CO within 60 days of contract award. Updates shall be submitted to the CO annually, thereafter and 15 days prior to any change in the schedule.
5.7.3.2	Conduct an annual inspection of SFUSS in accordance with the inspection plan and schedule defined in 5.7.3.1.	The purpose of the inspection is to obtain maintenance and repair information. This inspection shall not relieve the Contractor from establishing and implementing a continual inspection program for the timely identification of an occurrence of maintenance and repair work within the scope of this contract.	Contractor determined. Extent of SFUSS to be inspected is found in the following: SORD drawings located in the CEF	All inspections shall be completed no later than 1 February of each year Exhibit 8 of this Annex

Individuals conducting inspections shall be

FACILITY INSPECTION PROGRAMMED AND PLANNED MAINTENANCE

ANNEX 5.7

<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARD</u>
5.7.4	Record deficiencies on Facility Inspection Sheets and the Backlog of Maintenance and Repair (BMAR) databases.	<p>technically knowledgeable of the system being inspected.</p> <p>All deficiencies identified during the course of the inspections shall be recorded on Facility Inspection Sheets, Figures 5-7-1 and 5-7-2, and summarized in the existing institutional and test complex BMAR - databases and where indicated in this annex, on drawings. ROM estimates shall be provided and will be used for planning purposes only.</p> <p>See Exhibit 7 of this annex for a description of the BMAR database and field values.</p>	<p>Contractor determined</p> <p>Previous BMAR</p> <p>Inspection Sheets are available in the TRL.</p>	<p>Submit Facility Inspection Sheets and supporting documentation such as drawings and inspection checklists, within 5 days of each inspection.</p>

The Contractor shall remove duplicate records from

ANNEX 5.7
FACILITY INSPECTION PROGRAMMED AND PLANNED MAINTENANCE

<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARD</u>
		the databases prior to submitting to the government.		
5.7.4.1	Update the BMAR databases	As work identified in the BMAR is accomplished the corresponding record shall be removed from the active database and archived.	Nothing additional	The BMAR databases shall be available for review on request.
5.7.4.2	Record defects on drawings	Defects identified in the course of conducting the annual inspection shall be recorded on drawings for the following structures, facilities and utilities:	Nothing additional	Provide as supporting documentation as indicated in 5.7.3
		Roofs Roads Parking Areas Sanitary Sewer Collection System Storm Water Collection System		
				Roof drawings reside in the ROOFER database. The ROOFER program is government owned software that is used to manage roof maintenance.
				Drawings for the other systems are generated by the Contractor to identify the location and specific information relating to the nature of the defects.
5.7.5	Prioritize and submit the BMAR databases as indicated.			
5.7.5.1	Provide Maintenance Planning/Test Complex (DR 5-FA01)	The Contractor shall prioritize those projects in the Test Complex BMAR database that should be	1 Planned Maintenance Plan – submitted	Submit the Annual and Five Year Planned

ANNEX 5.7
FACILITY INSPECTION PROGRAMMED AND PLANNED MAINTENANCE

<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARD</u>
5.7.52	Provide Maintenance Planning/Institutional (DR 5-FA06)	<p>considered for funding in the following fiscal year. Selection should take into consideration; mission impact, length of time a project has been deferred, and priority.</p> <p>Annual historical budget: \$1,000,000</p> <p>The Contractor shall project requirements for Planned Maintenance Projects for five years. The Contractor shall prioritize the projects in each system. In addition, the contractor shall determine an overall ranking in order to establish the Annual Planned Maintenance Plan. Selection should take into consideration; mission impact, length of time a project has been deferred, and priority.</p> <p>Annual historical budget: \$800,000</p> <p>All BMAR projects fall within the following systems (SYSTEM is a field in the BMAR database with specific designated values – see Exhibit 7).</p> <ul style="list-style-type: none"> Roofs Sidewalks Roads and Parking Lots Sanitary and Storm Sewer Systems Hi-voltage System Electrical systems Exterior Paint 	<p>annually</p> <p>1 Annual Planned Maintenance Plan – submitted annually</p> <p>BMAR database, current as of March 1 of each year</p>	<p>Maintenance Plans and the BMAR database no later than March 1 of each year in an electronic spreadsheet format that is compatible with SSC site standards.</p> <p>Submit the prioritized BMAR database and recommended Annual Planned Maintenance Plan in an electronic spreadsheet format consistent with SSC site software standards no later than March 1 of each year.</p>

ANNEX 5.7
FACILITY INSPECTION PROGRAMMED AND PLANNED MAINTENANCE

<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARD</u>
	HVAC EMCS Natural Gas Systems Perimeter and Security Fencing Mechanical Systems Architectural	The government will evaluate the Contractor's recommendations and will notify the Contractor which projects are approved for design and detailed cost estimate by May 1 of each year.	The Contractor shall cost the design and estimate of Planned Maintenance Projects based on the following historical budgets:	Estimates for each project shall be submitted no later than August 1 of each year.
5.7.6	Provide cost estimates for each planned Maintenance Project approved by the government for the following fiscal year		Test Complex: \$1,000,000	Institution: \$800,000
5.7.7	Programmed Maintenance	Develop and maintain data base which accurately defines each Programmed Maintenance Task	Programmed maintenance shall be identified, classified as to frequency required, and a traceable record of accomplished tasks maintained.	Data base shall be updated monthly and be available for NASA review. Data base shall be developed and become part of the Contractor's
5.7.7.1			Programmed maintenance tasks shall be submitted to NASA Technical Operations Office at the start of each fiscal year for review.	Institution: Tasks/year Dependant on funding

ANNEX 5.7
FACILITY INSPECTION PROGRAMMED AND PLANNED MAINTENANCE

<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARD</u>
5.7.7.2	Annually, update the Programmed Maintenance data base to include new or modified installations and equipment	By the start of each Fiscal Year, the Contractor shall have an approved list of Programmed Maintenance items that will be accomplished during that Fiscal Year	1 Task	maintenance program within 60 days after contract award.
5.7.8	Accomplish Planned Maintenance Projects.	Annually, the Contractor shall develop a list of planned maintenance projects and submit the list to the CO for NASA review and approval. The list includes all planned projects for Institution and a separate list by Program for the various Test complexes. On completion of the NASA review, and the assignment of appropriate funding, the Contractor shall implement each of the projects in accordance with a schedule developed by the Contractor. All projects on the list will be completed and costed during the fiscal year unless a waiver is given.	Historical Annual Planned Maintenance Program	All New and Modified facilities, systems, equipment, and sub-systems shall be included in the data base by the October 1. Planned Projects shall be submitted to NASA for review in accordance with item No. 5.7.5.1. All approved projects will be completed and costed during the fiscal year. Test Complex: Institution: \$1,000,000 \$800,000

FACILITY INSPECTION SHEET

<input type="text"/>	IDENTIFICATION NUMBER	<input type="text"/>	EQUIPMENT NUMBER						
<input type="text"/>	INSPECTOR	<input type="text"/>	FACILITY IDENTIFICATION NUMBER						
<i>as per real property records</i>									
PROJECT TITLE: <input type="text"/>									
SYSTEM IDENTIFICATION:									
<input type="checkbox"/> <i>This section may be customized for a specific system</i>									
SUB-SYSTEM/OR OTHER DATA:									
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>						
<input type="checkbox"/> <i>This section may be customized for a specific system</i>									
LOCATION: <input type="text"/>									
INSPECTORS' ASSESSMENT OF URGENCY TO REPAIR: <table border="0" style="margin-left: 10px;"> <tr> <td><input type="checkbox"/> EMERGENCY</td> <td><input type="checkbox"/> ROUTINE</td> </tr> <tr> <td><input type="checkbox"/> URGENT</td> <td><input type="checkbox"/> DISCRETIONARY</td> </tr> <tr> <td><input type="checkbox"/> PRIORITY</td> <td><input type="checkbox"/> DEFERRED</td> </tr> </table>				<input type="checkbox"/> EMERGENCY	<input type="checkbox"/> ROUTINE	<input type="checkbox"/> URGENT	<input type="checkbox"/> DISCRETIONARY	<input type="checkbox"/> PRIORITY	<input type="checkbox"/> DEFERRED
<input type="checkbox"/> EMERGENCY	<input type="checkbox"/> ROUTINE								
<input type="checkbox"/> URGENT	<input type="checkbox"/> DISCRETIONARY								
<input type="checkbox"/> PRIORITY	<input type="checkbox"/> DEFERRED								
WHAT MAINTENANCE IS REQUIRED? <small>(Draw a sketch if needed for clarification. Use a continuation sheet if additional space is required.)</small> <input type="checkbox"/> <i>This section may be customized for a specific system</i>									
SKETCH <input type="text"/>									
DEFICIENCY / SOLUTION: <input type="text"/>									
ESTIMATED MANHOURS									
<input type="text"/>		FUND SOURCE							
FY NEEDED		<input type="text"/>							
<input type="text"/>		CLOSE-OUT DATE							
<input type="text"/>		<input type="text"/> ACTUAL COST							
		Labor							
		Material							
		Engineering							
		Documentation							
		TOTAL ROM COST							

Figure 5.7-1

FACILITY INSPECTION SHEET

IDENTIFICATION NUMBER

EQUIPMENT NUMBER

INSPECTOR

FACILITY IDENTIFICATION NUMBER

as per real property records

PROJECT TITLE:

SYSTEM IDENTIFICATION:

ELECTRICAL

INSTR. AND CONTROLS

BUILDING SERVICES

SUB-SYSTEM/OR OTHER DATA:

LIGHTING / EXIT
LIGHT / EXTERIOR
LIGHTING / EMERG.
LIGHTING / GENERAL
UPS / _____
UPS / BATTERY

DISTRIBUTION / MISC. / _____
DISTRIBUTION / MCC. / _____
DISTRIBUTION / PANEL / _____
DISTRIBUTION / SWGR / _____
DISTRIBUTION / RECEPTACLE / GFCI
DISTRIBUTION / RECEPTACLE

DISTRIBUTION / HVAC / _____
FIRE ALARM / TRANSCEIVER
FIRE ALARM / _____
ELEVATOR / _____
LIGHTNING PROTECTION
CATHODIC PROTECTION

LOCATION:

INSPECTORS' ASSESSMENT OF URGENCY TO REPAIR:

EMERGENCY

ROUTINE

URGENT

DISCRETIONARY

PRIORITY

DEFERRED

SKETCH

WHAT MAINTENANCE IS REQUIRED?:

(Draw a sketch if needed for clarification. Use a continuation sheet if additional space is required.)

MIXED VOLTAGES?

MISSING PANEL SCHEDULES?

MISSING EQ NUMBERS?

EQ NEED REPLACING?

DEFICIENCY / SOLUTION:

EXAMPLE
of a customized Facility Inspection Sheet

ESTIMATED MANHOURS

FY NEEDED

FUND SOURCE

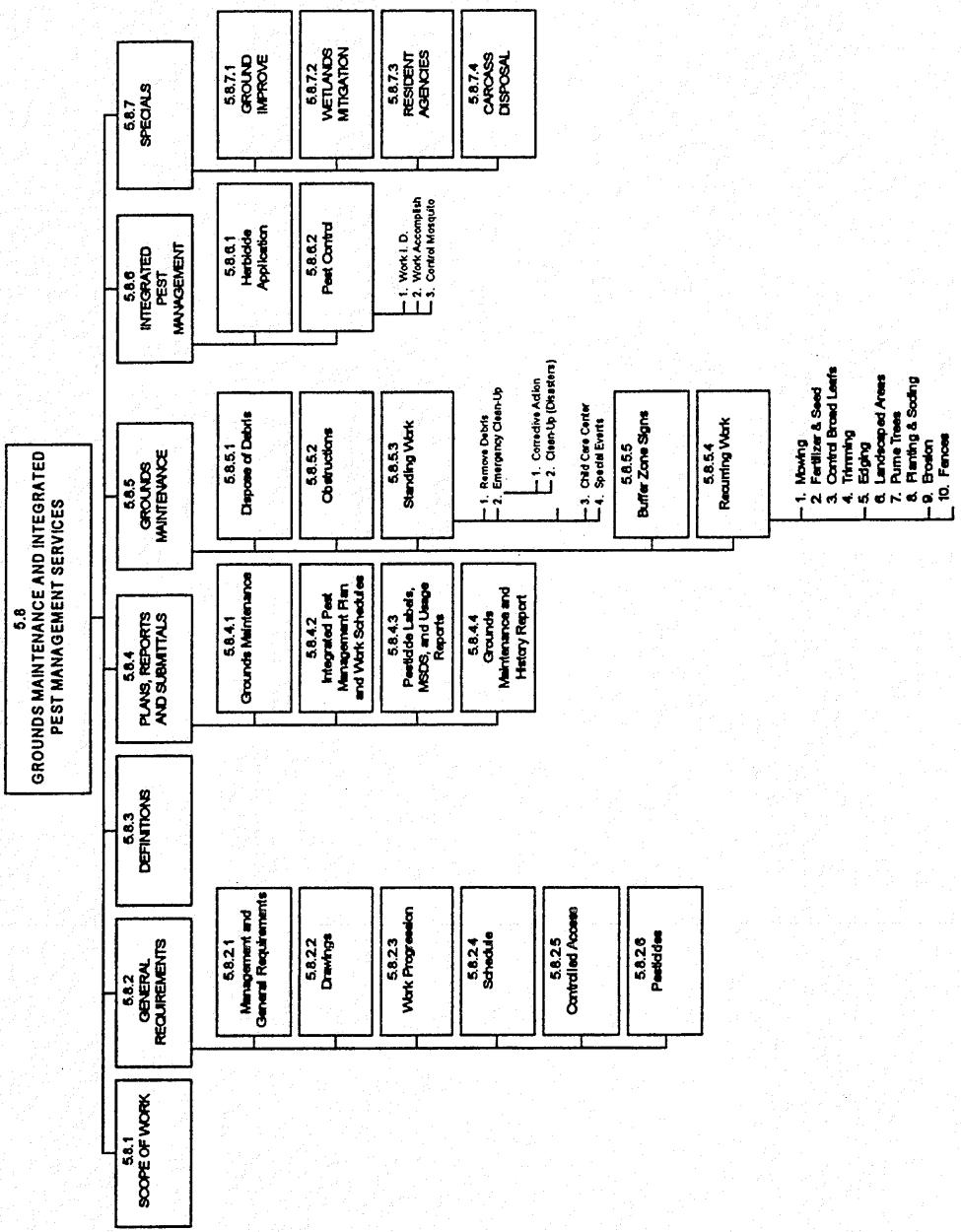
CLOSE-OUT DATE

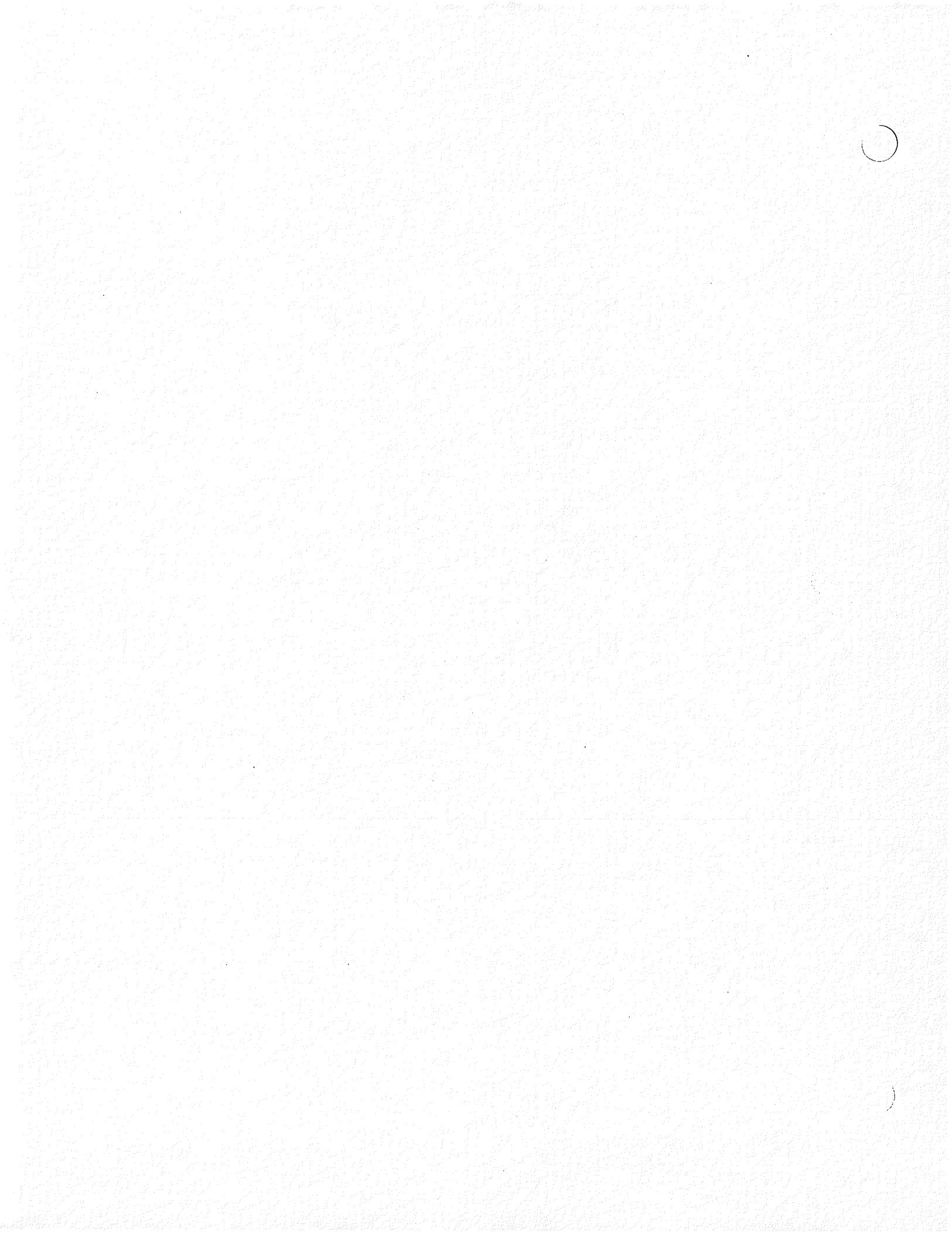
ACTUAL COST

Labor
Material
Engineering
Documentation

TOTAL ROM COST

Figure 5.7-2





ANNEX 5.8

GROUND MAINTENANCE AND INTEGRATED PEST MANAGEMENT SERVICES

5.8 GROUNDS MAINTENANCE AND INTEGRATED PEST MANAGEMENT SERVICES

5.8.1 SCOPE OF WORK

The Contractor shall provide grounds maintenance and Integrated Pest Management services at John C. Stennis Space Center.

5.8.2 GENERAL REQUIREMENTS

5.8.2.1 Management and General Requirements

The Contractor shall furnish all resources as specified in Annex 1.

5.8.2.2 Drawings

A list of drawings identifying exact locations of the areas to be maintained are specified in **EMI NC/GM/1000R & NC/HB/2000**. These drawings are located in the Central Engineering Files (CEF). The Contractor shall check all drawings upon receipt and shall promptly notify the CO of any discrepancies. The Contractor shall compare all drawings and field verify the maintenance areas and contract quantities before laying out the work and shall be responsible for any errors which may have been avoided otherwise.

5.8.2.3 Work Progression

Mowing, once begun in a designated area, shall be completed as specified prior to proceeding to another area unless otherwise directed by the CO.

5.8.2.4 Schedule

The Contractor shall schedule and arrange work so as to cause the least interference with the normal occurrence of Government business and mission in those cases. Where interference is unavoidable, the Contractor shall make every effort to minimize the impact of the interference and its effects.

5.8.2.5 Controlled Access

The Test Complex, Area B, is a security-controlled area which requires access approval from the Test Complex Access Coordinator. The week

prior to a scheduled service, access to the Test Complex shall be coordinated. If the test schedule causes previously approved access to be denied, the contractor shall coordinate a new date with the Test Complex Access Coordinator. If the new date is within 5 calendar days of the next scheduled mowing service, the contractor shall mow the area, skip the next scheduled date and then resume the normal mowing schedule.

5.8.2.6 Pesticides

The Contractor shall be licensed by the applicable state agency to provide pest control in the categories specified in this contract. All work shall be in accordance with federal, state, local and installation laws and regulations. All tanks, hoses, pumps, control valves, and gauges shall be free of visible deterioration, shall not leak, and shall operate at the manufacturers recommended rates and pressures. Equipment, which has failed, shall be replaced and/or repaired by the Contractor prior to resuming operations.

5.8.2.6.1 Control Methods. The Contractor shall utilize only pesticides registered by the Environmental Protection Agency and applicable state lead agency for the use intended. All pesticides, rinse water, and containers shall be disposed of in accordance with label directions. Pesticides, rinse water, and container shall not be disposed of on the Center. Pesticide spills shall be cleaned, decontaminated, and reported to the Environmental Officer. Pesticides shall not be mixed or stored on site.

5.8.2.6.2 Security. All pesticides carried on vehicles shall be secured in locked compartments at all times. Vehicles shall not be left unattended at any time unless properly locked and secured.

5.8.2.6.3 Certifications. All work involving the handling and or use of pesticides shall be performed by a certified applicator.

5.8.3 DEFINITIONS

Debris. Debris includes, but is not limited to, paper, cans, bottles, limbs and branches, pine straw and pine cones, leaves, rocks, and other similar items. Construction debris is excluded.

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ANNEX 5.8
GROUNDS MAINTENANCE AND INTEGRATED PEST MANAGEMENT SERVICES

Integrated Pest Management. The utilization of control measures coordinated for overall environmental protection so as to reduce pest numbers to a controlled level without adverse effects to the surroundings.

Maintenance Level. A designation used to specify the frequency of services and type of grounds maintenance required.

Mowing. Mowing shall include cutting and trimming, within the designated area, all grasses, weeds and other vegetation, which is 1 inch, or less in diameter (at ground level).

Pruning. Pruning is selectively removing unwanted growth to make a plant or tree grow or respond in a desired manner. Pruning differs from 'shearing'. Pruning involves selection and judgment. 'Shearing' means clipping all growth on a plant at a uniform distance and shape.

ANNEX 5.8
GROUND MAINTENANCE AND INTEGRATED PEST MANAGEMENT SERVICES

<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARDS</u>
5.8.4	PLANS, REPORTS, AND SUBMITTALS			
5.8.4.1	Grounds Maintenance Plan and Work Plans	Develop, submit and maintain as required in the DR. Implement procedures and changes to insure SSC compliance with the Executive Memorandum titled “** Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds**.” (See DR 5-GA16)	1 Plan, annual work plan, and monthly work plans per DR	Plan to include all requirements in items 5.8.5.
5.8.4.2	Integrated Pest Management Plan and Work Schedules	Develop, submit and maintain as required in the DR. 5-GA17. Utilization of beneficial predatory insects and other biological controls shall be considered whenever possible.	1 Plan, annual inspection schedule, monthly treatment schedules per DR	Plan to include methods and procedures for items 5.4.3 and 5.6
5.8.4.3	Pesticide Labels, MSDS, and Usage Reports	DR 5-GA21	per DR	Submit as required
5.8.4.4	Grounds Maintenance and History Report	DR 5-DM01	per DR	Submit as required
5.8.5	GROUND MAINTENANCE			
5.8.5.1	Dispose of Debris	All rubbish, debris and trash removed from the maintenance area shall be disposed of in the SSC landfill(s) in accordance with ** Landfill Operation Procedures**.	Contractor determined	No instance of non-compliance
5.8.5.2	Obstructions	Portable items such as trash containers and other similar items may require temporary relocation by the Contractor to properly maintain grounds areas. All drains , ditches and pipes, which become obstructed with accumulated grass clippings, soil,	Contractor determined	No instance of non-compliance

ANNEX 5.8
GROUND MAINTENANCE AND INTEGRATED PEST MANAGEMENT SERVICES

<u>ITEM NO.</u>	<u>PERFORMANCE REQUIREMENT</u>	<u>RELATED REQUIREMENTS OR INFORMATION</u>	<u>WORKLOAD DATA</u>	<u>MINIMUM STANDARDS</u>
5.8.5.3	Standing Work	mulch, and other material resulting from performance of work, shall be cleaned.		
5.8.5.3.1	Remove Debris	Remove debris from parking lots, building entrances and sidewalks.	1,200,000SF	Area shall remain free of visible debris and litter
5.8.5.3.2	Accomplish Emergency Clean-up			
5.8.5.3.2.1	Corrective Action (Non Disaster)	Includes removal of debris such as fallen trees and branches that present an immediate danger to customers. Locations will be provided by the CO.	5 requests annually	Begin clean-up within 1 hour of notification
5.8.5.3.2.2	Emergency Clean-up as a Result of Hurricanes, Tornadoes, Floods, or other Disasters	This work requires immediate response and sustained effort to minimize the effects of the disaster on SSC operations.	As Required	Meet performance requirements in the SWR and/or minimize disaster effects.
5.8.5.3.3	Building 2120 - Child Care Center	Add sufficient wood chips under and around play yard equipment to establish a depth of one foot. Do not bury debris.	1,300SF	Accomplish annually, in April or May
5.8.5.3.4	Replenish wood chips to provide a fall zone around equipment.			
	Special Events	Special events to be held in a specific area will require coordination of clean-up, mowing, and trimming actions. When such coordination is required, the specific location and date will be provided by the CO no later than 4:00 p.m. Thursday of the week prior to the event. This work does not represent an increase over the grounds maintenance provisions of paragraph 2.5.4. The Contractor shall delay the maintenance of an area or substitute for the	Nothing Additional	C-5.8 r 4

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	Remove Debris	next scheduled maintenance as directed by the CO. The Contractor shall schedule/accomplish clean-up services to the area no earlier than 24 hours and no later than three (3) hours prior to the scheduled event.	Nothing additional	No visible debris
	Mowing and Trimming	The Contractor shall schedule/accomplish mowing and trimming services to the area no earlier than 48 hours and no later than 24 hours prior to the scheduled event.	Nothing additional	
5.8.5.4	Recurring Work	Provide the following Grounds Maintenance Services during the period March 15 through November 15, unless otherwise specified.	See below	Mowing methods shall not include use of animals. Prior to mowing, the Contractor shall remove debris and trash from maintained areas.

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	Mowing along major roads - HWY 607, Shuttle Parkway, Balch Blvd and Saturn Drive shall not be permitted during the hours of 7:00-8:30 A.M. and 3:15-4:30 P.M., Monday through Friday.			the frequencies indicated below:
5.8.5.4.1.1	Mowing, Maintenance Level I	Any holes shall be filled prior to mowing. Mowing shall be accomplished free of scalping, rutting, bruising, and uneven and rough cutting. Grass clippings shall be uniformly distributed over the mowed area and shall not be windrowed or deposited in piles or clumps.	83 acres Weekly, (5-7 calendar days)	
5.8.5.4.1.2	Mowing, Maintenance Level II	Mowing shall be accomplished free of scalping, rutting, bruising, and uneven and rough cutting.	283 acres Bi-weekly (14 - 16 calendar days)	
5.8.5.4.1.3	Mowing, Maintenance Level III	see 5.8.5.4.1.2	379 acres Monthly (28-31 calendar days)	
5.8.5.4.1.4	Mowing, Maintenance Level IV	see 5.8.5.4.1.2	337 acres Annually (350-380 calendar days)	
5.8.5.4.1.5	Roadway Shoulders and Ditches Maintenance Levels I-IV	Roadway shoulders shall be maintained to include the areas from the bottom of the ditch, or the level of water if filled, to the edge of the dirt, gravel or asphalt roadway surface, or concrete curb as applicable. Ditches shall be maintained to include the ditch bottom, if dry, or to the level of water, if filled.	Nothing additional Meet the minimum mowing standard for the applicable maintenance Level	
5.8.5.4.2	Fertilize and Seed Maintenance Levels I-II	Required to sustain healthy plant growth and uniform color	407 acres Maintain healthy plant growth	
5.8.5.4.3	Control Broad Leaf weeds Maintenance Level I	Maintenance procedures can include prevention as well as removal. Repair all scalped/stripped areas resulting from prevention/removal processes.	142 acres Attain 70% control of broad-leaved weeds at a minimum.	
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		Apply herbicides as necessary to meet requirements.		
5.8.5.4.4	Trimming			
5.8.5.4.4.1	Trimming; Area A Maintenance Levels I-IV	Trim around obstacles and along edges of adjacent raised surfaces, to include, but not limited to , trees, shrubs, curbs, pavements, fire hydrants, and walls. Trimming shall be accomplished by use of mechanical equipment.	Nothing additional	Trimming shall be considered a part of the mowing activity and shall be accomplished concurrently.
5.8.5.4.4.2	Trimming; Area B Maintenance Levels II-IV	Trimming around trees shall be accomplished by use of mechanical equipment Herbicide may be used to control vegetation around other obstacles to the extent shown on **Test Complex Herbicide Spray Schedule** and accompanying drawings.	Nothing additional	See 5.5.4.4.1 for mechanical trimming See 5.6.1 for herbicide application
5.8.5.4.5	Edging - Specific areas to be edged are delineated in the Grounds Maintenance drawings.	Edge grass directly adjacent to sidewalks and curbs. Edge lawns to achieve a straight vertical edge where the grass meets the edge of the obstacle.	45,150 LF	Monthly (28-31 calendar days)
5.8.5.4.6	Maintain Ditches	Repair eroding ditches, ruts, and scalped areas on ditch slopes and eroding grounds, around headwall structures promptly and keep culverts and drop inlets free of all obstructions and weed growth.	2,500 LF	Year round. Maintain a free flowing condition with no debris, or dead vegetation accumulations
5.8.5.4.7	Maintain Landscaped Areas	Specific locations are delineated on the Grounds Maintenance Drawings. Maintenance equipment shall be removed or stored out of sight when not in use. Landscaped areas include patio areas in Buildings 1020, 1002, and 1105.	70,500 SF	Nothing additional
5.8.5.4.7.1	Remove Undesirable Vegetation	Undesirable vegetation includes but is not limited to:		Maintain landscaped areas

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5.8.5.4.7.3	Fertilize Plant Beds	grass, weeds, fungus, thistle, dallis grass, clover and other vegetation not initially planted or maintained for aesthetic value.	Apply fertilizer as necessary to sustain healthy plant growth.	Nothing additional Year round free of undesirable vegetation
5.8.5.4.7.3	Remove Surface Debris		Includes debris litter the surface or partially buried (visible) debris.	Nothing additional Clean areas no less than weekly. Area shall be free of visible debris and litter.
5.8.5.4.7.4	Prune Hedges and Shrubs to Maintain Proper Size, Shape, and Appearance	Pruning of hedges and shrubs is required when new growth reaches 4" for fast growing shrubs and 6 inches for slow growing shrubs. Shrub trimming shall be performed in a manner that maintains or enhances the plant's natural growth patterns.	Nothing additional	Maximum shrub height shall be maintained as follows: Shrubs planted directly in front of windows shall not exceed the window sill height except for windows less than 4 feet above the ground for which shrubs shall not exceed 4 feet. Shrubs planted in open landscaped areas, corners or near stop signs and other areas where the shrubs may hinder visibility shall not exceed 5 feet. All other shrubs shall not exceed 6 feet in height.
5.8.5.4.7.5	Apply Organic Mulch (e.g. decorative bark) in Planting Beds	Bark shall be pine or softwood bark mulch or better. When new bark is not required, turn and rake existing bark to present a fresh and clean aesthetic appearance.	Nothing additional	Apply bark to maintain a minimum of 2" and a maximum of 3" in March and October.

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5.8.5.4.7.6	Maintain Plant Beds in the Atrium in Building I100	Fertilize and water to maintain healthy plant growth Prune trees and trim plants.	2,500 SF	Maintain healthy growth and aesthetic appearance, year round
5.8.5.4.7.7	Plant Annuals, Flower Beds in Area A, at the gate signs, and in the Test Complex area	Continually plant/maintain seasonal flowering plants	4,600 SF	Maintain a full garden appearance
5.8.5.4.7.8	Ground Cover in Landscaped Areas	Use of vines, as a ground cover shall not be permitted.	Nothing additional	Maximum height of ground cover shall not exceed 12 inches
5.8.5.4.8	Prune Trees; Maintenance Levels I-IV, Areas A and B	Prune trees according to their natural growth habit. Pruning is to be done in a manner so as to: Remove dead, damaged or diseased wood, parasitic vegetation and structurally weak limbs that may cause a safety hazard. Remove branches to provide clearance over sidewalks, roadways, parking lots, driveways, buildings roofs, eaves, and windows. Remove branches to provide clearance for buses, and similar vehicles along streets. Cut back branches that overhang or grow into powerlines. Shape the entire tree rather than notch the top. Prevent growth of small trees in front of windows, over entranceways or walks and trees, which will obstruct vision at street intersections.	Areas A & B Maintenance Levels I - IV. a) 2,150LF b) 110,050LF c) 26,800 LF	Complete pruning of trees no later than April 1, annually. a) <13.8Kv: 10 LF either side of centerline b) 13.8Kv Single circuit: 15 LF either side of centerline c) 13.8Kv Dual circuit: 30LF either side of centerline
5.8.5.4.9	Grass Planting and Sodding	The Contractor shall repair washed out and bare areas with a type of soil identical to that of the surrounding area and reestablishing grass by seeding or sodding.	Maximum 500 SF	Bahia grass shall not be used in any location at SSC.

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			<u>DATA</u>	
	Bare spots exceeding 1/2 SF in Maintenance Level I areas shall be resodded.			
5.8.5.4.10	Prevent Erosion and Drainage Problems Such as Damming, Ponding, Flooding, etc	Corrective action required as a result of erosion outside the Contractor's control shall be performed per paragraph 5.7.	10,000 SF	No loss of ground cover due to Contractor negligence
5.8.5.4.11	Keep Fences Free of Vegetation, Child Care Facility 2120 and Summer Day Camp Area Building 2436	Trim grass away from fences on both sides. Herbicide shall not be used.	1015 LF	Fences shall remain free of vegetation at all times.
5.8.5.5	Buffer Zone Signs	Clean signs and clear brush around the signs. The locations of the Buffer Zone signs are indicated on a drawing located in the Central Engineering Files at SSC.	30 signs annually	Perform annually (350-380 calendar days)
5.8.6	INTEGRATED PEST MANAGEMENT			
5.8.6.1	Herbicide Application			
5.8.6.1.1	Herbicide Application, Areas A and B	Specific locations and quantities are shown on Herbicide Spray Schedule and accompanying drawings. Sterilization may be required more than once annually to meet the minimum standard. Prevent growth of all vegetation in paved and unpaved parking and storage areas and cracks in paved roads, sidewalks, dock areas and curb joints Area B - Maintain a vegetation free strip extending one foot from the edge of all buildings, around poles,	Area A -140,600SF Parking Lots - 1,200,000 SF Area B-270,000SF	Treated areas shall remain completely free of vegetation at all times. If a residual herbicide is used, it must be non-leaching with minimal toxicity